BRUSH RESOURCES, INC.
Beryllium Mill - Delta, Utah

Application for Class IIIb Landfill Permit

Prepared For:
Brush Resources, Inc.
P. O. Box 815
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Submitted April 14, 2003

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INTRODUCTION

With this modified *Checklist for Class IIIb Landfill,* Brush Resources, Inc. (Brush) is submitting the enclosed application for a landfill permit for the existing onsite landfill located at the beryllium mill site near Delta, Utah.

General description of the facility (R315-310-3(1)(b))
Brush owns and operates a beryllium mill facility located approximately 10 miles north of Delta, Utah. The existing landfill is located north of the main manufacturing buildings in the tailings pond. The landfill has been in use for approximately 30 years and consists of two cells, one active and one for future use. The active cell is located in a designated area of the current tailings pond. The inactive cell is located southeast of the current tailings pond. See Attachment A for maps of each cell location.

No unauthorized or unacceptable waste is placed in the landfill. The Brush facility is secure; a fence surrounds the property and entrance to the facility is gained through a security-manned access booth. Within the plant, the operators are trained to know and understand the limitations on waste that can be deposited in the landfill and there are staff assigned to monitor the acceptance of material for disposal. Onsite waste handling consists of the waste being moved to the landfill cell by forklift, truck, or hand carried. Cover is applied with a front loader, using tailings slimes that mainly consist of clay; thus providing a better seal than topsoil.

Location Standards of R315-304-4(2):

R315-304-4(2)(c) states "An existing Class IIIb landfill shall not be subject to the location standards of Subsection R315-304-4(2)(a)." The landfill located within the Brush mill site is an existing Class IIIb landfill; therefore, the location standards are inapplicable. However, cell one of this landfill, located within the confines of the current tailings pond system at the mill, is elevated above the general topography such that it will have no adverse impact on the surrounding land, is not located within any wetland, and, at its lowest level, is greater than five feet above the historical high level of ground water. All of this information is verifiable within documentation already submitted to the Division of Water Quality for purposes of obtaining and renewing the existing Groundwater Permit No. UGW270001. This documentation is submitted as Attachment B, Section J; the Groundwater Permit is submitted as Attachment C.

Legal description of the facility (R315-310-3(1)(c))
The legal description of the existing onsite landfill is:

NE ¼ Section 32, Township 15 South, Range 5 West, Salt Lake Base and Meridian
Latitude: 39°28'22", Longitude: 112°26'7"

Land use in the surrounding area consists of agriculture and grazing. There is a coal-fired power plant, owned by Intermountain Power, located approximately 7 miles northwest of the site. Aside from the power plant and the nearby town of Lyndyll, most of the surrounding area is in its undisturbed, natural state.

Types of waste and area served by the facility (R315-310-3(1)(d))
The landfill accepts non-hazardous waste that is generated at the beryllium mill site. The waste consists of obsolete equipment, pallets and other debris generated during plant operations, empty drums, and other industrial debris. The waste may be contaminated with beryllium. Within the plant, the operators are trained to know and understand the limitations on waste that can be deposited in the landfill and there are staff assigned to monitor the acceptance of material for disposal. No other wastes are accepted; therefore, this landfill is not a commercial landfill and no other areas are served.

PLAN OF OPERATION (R315-310-3(1)(e))

Intended schedule of construction (R315-302-2(2)(a))
There is no intended plan of construction for the first cell since it is already in existence. Construction details of the tailings pond are listed in the Ground Water Discharge Permit, located in Attachment C. The second cell will be constructed southeast of the current cell, after the permit has been received, but no later than 18 months after the permit is issued. The construction of the second cell will only require an access road from the existing road into the cell, for ease of movement of waste to the cell.

Description of onsite waste handling procedures (R315-302-2(2)(b), R315-310-3(1)(f))
Onsite waste handling consists of the waste being moved to the landfill cell by forklift, truck, or hand carried. A log is kept of the type of waste placed in the landfill. See Attachment D, Section 1 for a copy of the log sheet. Cover is applied, using wet clay material from the tailings pond (tailings slime) for Cell 1, and soil for Cell 2. The entire site is secured with fencing, locked gates, security manned entrances, and controlled access.

Schedule for conducting inspections and monitoring (R315-302-2(2)(c), R315-302-2(5)(a), and R315-310-3(1)(g)):

Operational monitoring of the tailings pond occurs daily. The monitoring identifies any problems or potential problems to human health or the environment. Inspections are designed to prevent malfunction or deterioration, operator errors, and discharge monitoring. Since the landfill is located in the tailings pond, it may be included in the daily inspection, or, at a minimum, quarterly. A copy of the inspection log sheet is located in Attachment D, Section 2.

Contingency plans in the event of a fire or explosion (R315-302-2-(2)(d))
The waste is not flammable. Some combustible material (paper, cardboard, wood, etc.) may exist; however, a fire or explosion in the landfill area is highly unlikely. The area is served by the local fire department, and equipment is located onsite to move soil for fire suppression, if necessary.

Corrective action programs to be initiated if ground water is contaminated (R315-302-2(2)(e))

According to R315-304-5(1)(a), this is not applicable to Class III landfills. However, since there is a current Groundwater Permit in place, corrective actions in the event of groundwater contamination are addressed within the permit. Attachment A shows the location of the landfill relative to the entire tailings pond system and mill facility. As per the groundwater permit, the tailings pond (and landfill) has a liner consisting of at least 24 inches of tailings slimes with an effective or hydraulic conductivity of 1×10^{-6} cm/sec. Also, as per the groundwater permit, there is a system of monitoring wells in place to monitor any potential impact to groundwater. See Attachment B, Section J – Description of Operations.

Contingency plans for other releases, e.g. explosive gases or failure of run-off collection system (R315-302-2(2)(f))

According to R315-304-5(1)(a), this is not applicable to Class III landfills.

A plan to control fugitive dust generated from roads, construction, general operation and covering the waste (R315-302-2(2)(g)

Fugitive dust is controlled by prudent speed and moisture content of the road base. The site's Title V Air Quality Permit includes a 40% opacity limit on fugitive dust. Cover is applied to the landfill and consists of tailings slimes that are wet in nature for Cell 1 and soil for Cell 2.

Description of maintenance of installed equipment (R315-302-2(2)(h))

According to R315-304-5(a), this is not applicable to Class III landfills.

Procedures for excluding the receipt of Regulated hazardous or PCB containing waste (R315-302-2(2)(i))

Hazardous waste is handled in accordance with all federal, state, and local laws and transported for disposal offsite to approved, permitted facilities. Employees are trained to identify and classify waste according to its hazard class. An active hazardous waste management plan is in place. There are no PCB containing wastes onsite.

Procedures for controlling disease vectors (R315-302-2(2)(j))

The waste materials in the landfill are not attractive to disease vectors or support vector habitats; therefore no special method to control them is necessary. However, the cover of six inches is sufficient to control disease vectors. Although wastewater and leachate is pumped into the tailings pond, the area where the landfill is located is protected from this water, and no water is pumped into the landfill section.

A plan for alternative waste handling (R315-302-2(2)(k))

In the event of the landfill being unable to accept onsite waste, any non hazardous waste that is unable to be deposited can be placed into a large waste receptacle until the onsite landfill is either, able to accept the waste, or, until another onsite location is determined.

A general training and safety plan for site operations (R315-302-2-(2)(n))
Please refer to Attachment E for Brush's general site safety plan addendum as it relates to the landfill at the Delta mill facility.

MAPS

Current topographical map (R315-310-4(2)(a))
Refer to Attachment A for the current topographical map.

Most recent U. S. Geological Survey topographic map.
Refer to Attachment A for the most recent U. S. Geological Survey map.

ENGINEERING REPORT – PLANS, SPECIFICATIONS, AND CALCULATIONS

Cell design, cover design, fill methods, elevation of final cover including plans and drawings (R315-310-3(1)(b))
The landfill has been created using the cell method of filling. Waste is deposited as needed. The working face of the cell is approximately 10'x5'x5'. Since the active cell of the landfill is located in the tailings pond, details of the operation of the pond are located in Attachment B, Section J. The area in which the inactive cell, (Cell 2), is located is an old tailings pond area, thus the design is very similar to the active cell area (Cell 1). The manner in which Brush plans to close the landfill at the mill facility will meet all requirements of R315-305-5(5)(b). The waste contained in the landfill is already covered in place and leveled on a regular basis. This practice will continue as long as the landfill is in use and at the time for closure. The final filled area will be covered with at least the minimum required cap consisting of two feet of soil including six inches of topsoil. The final cap will be contoured such that the grade is greater than 2 percent and less than 33 percent and will be revegetated with native vegetation or a suitable alternative approved by the Executive Secretary for other similar operations. Any deviation from this plan will be submitted in advance to the Executive Secretary and the Division of Solid and Hazardous Waste for consideration and approval.

Design and location of run-on and run-off control systems (R315-310-5(2)(b))
Details of the tailings pond, its design and operation, are discussed in the Ground Water Discharge Permit. Operations under the Ground Water Permit conditions meet or exceed this rule. Because Cell 1 of the landfill is part of the tailings pond system that is completely raised and enclosed, there is no potential for run-on from a 25-year storm event and there is more than adequate capacity to contain any run-off from a 25-year storm event. Cell 2 of the landfill is located in an area which has also been designed to contain any run-off from a 25-year storm event. There is no potential for run-on.

CLOSURE PLAN (R315-310-3(1)(h) and R315-310-5(2)(c))
Brush will, within 60 days after certification of closure, notify the Millard County Recorder to file proof of closure as outlined in R315-302-2(6). The Closure Plan immediately follows this checklist.

POST-CLOSURE CARE PLAN (R315-310-3(1)(h))

Brush will provide post closure activities for the landfill that will include, at a minimum, monitoring of land and water, for a period of 30 years, or as long as the Executive Secretary determines is necessary for the landfill to become stabilized and to protect human health and environment. The Post Closure Plan immediately follows this checklist.

FINANCIAL ASSURANCE (R315-310-3(1)(j))

Identification of closure costs including cost calculations (R315-310-4(2)(d)(iv))

Since Cell 1 of the landfill is located in the tailings pond, for which closure costs have been calculated, closure of the tailings pond will also close the landfill. Closure of Cell 2 will also occur at the time of the tailings pond closure. Closure costs for the tailings pond are located in Attachment 1 of the Closure Plan. Using these calculations, the costs for closure of the landfill section are approximately $13,000.

Identification of post-closure costs including cost calculations (R315-310-4(2)(e)(iv))

Post closure costs for the tailings pond are located in Attachment 1 of the Closure Plan. Using these calculations, the costs for post-closure of the landfill are approximately $15,370. This includes reseeding and site inspections.

Identification of the financial assurance mechanism that meets the requirement of Rule 315-309 and the date the mechanism will become effective (R315-309-1(1))

Financial Assurance mechanism will be finalized once permit has been issued.

Closure and Post Closure Plan
for
Brush Resources, Inc.
Delta, Utah Mill Refuse Landfill

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1.0 Introduction

Brush Resources, Inc. (Brush) is submitting the enclosed Closure and Post-Closure Plan in accordance with the State of Utah, Division of Solid and Hazardous Waste's (DSHW) R315-304-5 rules with this document.

1.1 Site Description and Background

Brush owns and operates a beryllium mill facility located approximately 10 miles north of Delta, Utah. The existing landfill is located north of the main manufacturing buildings in the tailings ponds. The landfill has been in use for approximately 30 years and consists of two cells, one active and one for future use. The active cell is located in a designated area of the current tailings pond. The inactive cell is located southeast of the tailings pond area. See Attachment A for maps of each cell location.

The mill landfill is an industrial solid waste landfill that meets the classification of a Class IIIb Landfill. It is not accessible to the public, and accepts only non-hazardous debris that is generated onsite. The landfill is not located on public lands or near public drinking water supplies. The landfill is not located in a subsidence area, flood zone, near designated wetlands, or above an underground mine. There are no surface bodies of water, residential dwellings, or incompatible structures within ¼ mile of the landfill. The coordinates of the landfills are as follows:

NE ¼ Section 32, Range 5 West, Township 15 South
Latitude 39°28'22" Longitude 112°26'7"

2.0 Statement of Closure Plan

Brush is required to submit Closure and Post-Closure Plans in a way that "minimizes the need for further maintenance and minimized the post-closure formation and releases of leachate and explosive gases to the air, groundwater or surface water to the extent necessary to protect the public health and welfare and prevent any nuisance." This document represents Brush's compliance with R315-302-3 (2).

3.0 Closure Plan

3.1 Methods, Procedures, and Processes

All materials disposed of within the existing Class IIIb landfills have been and will continue to be within the acceptable waste constituents of an industrial non-hazardous landfill. The landfill accepts only non-hazardous waste that is generated at the beryllium mill site. The waste consists of obsolete equipment, pallets and other debris generated during plant operations, emptied, triple rinsed drums, and other industrial debris. (Refer to the current Ground Water Discharge Permit, issued by the Utah Division of Water Quality, Section 1C1, located in Attachment C). No other wastes are accepted; therefore, this

landfill is not a commercial landfill and no other areas are served. On average, approximately 10 cubic yards per day of this waste is disposed at the landfill.

3.1.1 Maintenance and Control

Access to the facility is restricted through plant security and property fencing. Signs are posted indicating authorized personnel only are allowed on the access roads leading into the plant. Wind dispersal of landfill litter is minimized by the application of cover.

After cessation of operations at the beryllium mill, the landfill will be closed with an application of the intermediate cover and a complete inspection of the surface will be performed. Cleanup of the site will be performed concurrently. All remaining visible litter and debris in the immediate vicinity will be placed in the final lift of the landfill unit. At that time, the final cover will be applied. A thorough closure inspection shall consist of observations for erosion, sloping, drainage, surface leachate, and run-on. Areas requiring repairs/modifications will be documented on the Landfill Inspection Form (see Attachment D, Section #2). Necessary modifications will be made using appropriate materials and compacted, as required.

3.1.1.1 Escape of Air Pollutants/Gases

The contents of this industrial waste landfill have little or no amounts of putrescible materials and the decomposition of the organic wastes are minimal. The U.S. EPA reports that methane is generated from "municipal" solid waste only when the moisture content exceeds 40% (U.S. EPA, 1994). Due to the limited moisture at the site and the absence of putrescible wastes contained in the heap, methane gas generation is not anticipated. Vector, dust, and odors are effectively controlled so they are not a nuisance or hazard to health, safety or property. None of the waste is flammable, but combustible waste may exist; however, a fire or explosion in the landfill area is highly unlikely. The area is served by the local fire department, and equipment is located onsite to move soil for fire suppression, if necessary.

3.1.1.2 Control of Run-off

Runoff from the landfill is not expected to occur due to the design. After closure, the absorption and evapotranspiration by the vegetation layer and the absence of any appreciable run-on will ensure the control of runoff. Once the vegetation layer growth is established, most storm events will not result in significant direct run-off from the landfill surface area. Nonetheless, significant percolation through the cover layer is unlikely, thus leachate or seepage from the heap is minimal.

3.1.2 Final Facility Topography

Refer to groundwater monitoring plan, Attachments B and C.

3.1.3 Drainage Plan

Refer to groundwater monitoring plan, Attachments B and C.

3.1.4 Composition of Cover

The final cover system will be made of the intermediate compacted cover, compacted soil layer, and vegetation layer. The material used for final cover will be placed on the graded, compacted, intermediate cover layer (12 inches of intermediate cover). The soil layer material will be compacted and will be composed of clayey silt-sand mixture with a low permeability. The soil layer will be no less than 6 inches of compacted soil and will come from onsite sources. These two layers total 18 inches of compacted soil, which will serve to minimize infiltration. A vegetation layer of no less than 6 inches will then be applied. The vegetation layer will be of an organic composition that will support native or compatible plant life. The final cover depth will be no less than 24 inches.

3.1.4.1 Sloping

The final cap will be contoured such that the grade is greater than 2 percent and less than 33 percent and will be revegetated with native vegetation or a suitable alternative approved by the Executive Secretary for other similar operations. Any deviation from this plan will be submitted in advance to the Executive Secretary and the Division of Solid and Hazardous Waste for consideration and approval.

3.1.4.2 Landscaping

The waste will be leveled to the extent practicable, covered with a minimum of two feet of cover and the cover contoured as described above. No vegetation, other than local introduced and native grasses and woody species identified in this plan will be placed on the landfill.

3.1.4.3 Vegetation

The vegetation layer provides the base for native plants to grow. The layer will be of sufficient organic content and volume such that the landfill's approved seed mixes will have the ability to prosper. Approved seed mixes for the area include:

Common Name	Scientific Name	Per Acre
Indian Rice Grass, variety *nezpar*	*Oryzopsis hymenoides*	3.0 lbs
Western Wheatgrass variety *arriba*	*Agropyron smithii*	3.0 lbs
Crested Wheatgrass variety *hycrest*	*Agropyron cristatum*	2.0 lbs
Snake River Wheatgrass variety secar	*Agropyron*	2.0 lb
Apar Lewis Flax	*Linum lewisii*	2.0 lbs
Four Wing Saltbush	*Atriplex canescens*	2.0 lbs
Greasewood		2.0 lbs
Alkalai Sacaton	*Sporobulos airoides*	2.0 lbs

The final seed mixes will be a combination of the above mentioned seeds, and planted by the drilling method. Approximately 5 acres will be seeded during closure at a density of approximately 18 pounds per acre.

3.1.5 Description of Monitoring and Maintenance

Qualified personnel will be located near or around the landfill to supervise continued activities during closure. The closure of the landfill will be concurrent with the landfill's final development. Landfill operations will proceed in a manner that will minimize the working area of the landfill. Once the final intermediate cover is placed and graded, post-closure landfill inspections will commence. The Landfill Inspection Form (see Attachment # 1) will be used for the final closure inspection.

3.1.6 Contact Personnel

The following positions and personnel represent Brush's contact list of responsible officials as they pertain to the Delta Mill Landfill.

Landfill Owner: Brush Resources, Inc.
Operator: Dan Perry
Address: P.O. Box 815
Delta, Utah

Contact Person: Dan Perry
Phone: 435-864-1237

3.2 Maximum Portion of Operation

The cell method of land filling is in use at the landfill, within the tailings pond system. Thus, the working face has been limited to the smallest area practical in order to confine the amount of exposed waste without interfering with effective operation. The maximum working face (surface area) open at any one time has been approximately 150 square feet, a total maximum height of 15 feet and horizontal distance of approximately 10 feet.

3.3 Maximum Inventory and Estimated Life

Based on the final closure design, original topography, and volume of the final cover, the maximum inventory for cell one of the landfill will be approximately 112,990 cubic yards. The total volume (including final cover) is estimated to be 124,170 cubic yards. The average volume loading of waste to the landfill is approximately 96.30 cubic yards (~27 tons) per year. The maximum inventory for cell two of the landfill will be approximately 48,400 cubic yards. The total volume (including final cover) is estimated to be 54,789 cubic yards. The average volume loading of waste to the landfill will be approximately 96.30 cubic yards (~27 tons) per year. The estimated life of the landfill, based on the above volumes and an existing waste volume of 52,000 cubic yards in cell one, is approximately 42 years from the time of this submittal.

3.4 Schedule for Completion

Within 60 days of scheduled completion of the landfill, Brush will notify the DSHW. Closure activities will commence within 30 days after receipt of the final volume of waste, and will be completed within 180 days of the start time. Brush will notify the DSHW upon completion of closure to schedule the final inspection by regulatory agencies.

3.5 Notification and Review

Within 60 days of certification of closure of the mill landfill, Brush will make the proper notification and submittals to the Millard County recorder and, upon doing so, file proof of title filing with the Executive Secretary. With respect to the requirement at R315-302-2(6)(b) for public access to records containing information about solid waste amounts, location, and periods of operation, Brush files annual reports to the Division of Solid and Hazardous Waste, as required. These documents are public records and may be obtained by local zoning authorities from either the Division or Brush, upon request.

3.6 Closure Activity Notification

Brush will begin closure activities of the landfill in accordance with the approved Closure Plan no later than 30 days following the final receipt of waste at the landfill. Closure activities shall be completed within 180 days from their starting time, however, Brush reserves the right for reporting extensions of the deadline for beginning and concluding closure activity. The Executive Secretary will be given written justification for any extension requests. If necessary, fences will be erected to limit service and signs will be posted at conspicuous locations

indicating closure activities have begun. Alternative disposal site locations will be indicated on the closure notice signs.

4.0 Post-Closure Plan

After the Closure Plan has been executed, completed, and certified, the following post-closure and end use plan will be implemented. Following closure of the landfill, Brush will conduct the appropriate industrial landfill post-closure care.

4.1 Maintenance of Final Cover

Facility maintenance and monitoring of applicable gases, land, and water constituents will be conducted for a period of 30 years after closure. The landfill cover and surrounding areas will be inspected and repaired by Brush or Brush contractor on a quarterly basis for the first year, then semi-annually for 29 years thereafter. The Post-Closure Inspection Form is shown in Attachment #1.

4.1.1 Repairs

During landfill inspections, if any settlements, subsidence or erosion areas are found on the cover, they will be promptly backfilled with onsite compatible (similar permeability) soil. After final grading, the area will be re-vegetated with the prescribed native seed mix. If there are areas of inherent erosion it will be documented on the Landfill Inspection Form and addressed by re-grading and placement of appropriate cover material. To prevent integrity breaks in the cover due to mechanical agitation, notices will be posted and access will be limited to inspection, maintenance, and monitoring personnel. Repairs will be made promptly with the appropriate soil, rip rap, or other necessary materials that will be compatible to the immediate environmental factors that cause breeches in the cover integrity.

4.1.2 Prevention of Run-On and Run-Off

Because the landfill is part of the tailings pond system that is completely raised and enclosed, there is no potential for run-on from a 25-year storm event and there is more than adequate capacity to contain any run-off from a 25-year storm event.

4.1.3 Maintenance and Operation of Leachate Collection System

Exempt for Class IIIb landfills.

4.1.4 Monitoring of Surface and Groundwater

Groundwater monitoring for Class IIIb landfills are exempt by R315-304-5(4)(c). Surface water monitoring is not required.

4.1.5 Monitoring of Gases

Because of low moisture content and minimal putrescible waste, generation of gases is not expected, and thus monitoring of gases is not applicable.

4.2 Post-Closure Care Statement

Brush will conduct post-closure monitoring and maintenance care as necessary or as directed by the Executive Secretary for a period of 30 years from date of closure. Reduction or extension of the 30 year monitoring and maintenance care period may be negotiated between the Executive Secretary and Brush management.

4.3 Post-Closure Use Statement

Post-Closure use is anticipated to be very minimal. Post-Closure use will not increase the foreseeable threat to public health.

4.4 Post-Closure Certification

Brush will submit written verification following the closure of a landfill unit and following the completion of post-closure care of a landfill unit. This verification will state the completed activities are in accordance with the requirements of R315-302-3(7)(b).

5.0 Submittal Statement

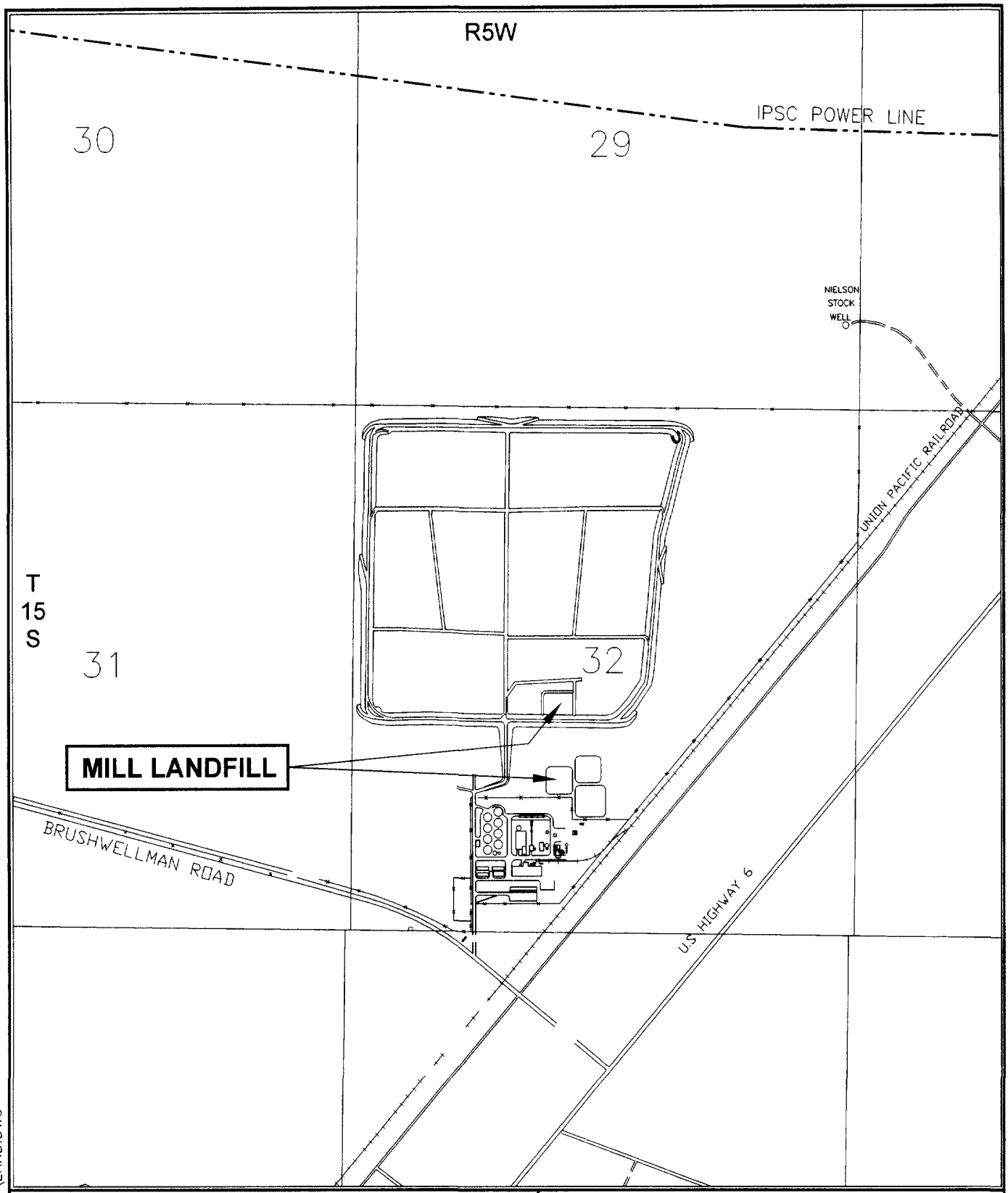
The Closure Plan, Post-Closure Plan, and other necessary documents were prepared and submitted to the Division of Solid and Hazardous Waste.

No subsequent modification to the Closure and post-Closure Plan will be made without the approval of Executive Secretary. Brush reserves the right to petition to amend the Post-Closure Plan.

Brush will keep a copy of the most recent approved Closure Plan and Post-Closure Plan at the Delta Mill Offices.

Attachment A

Maps of Landfill



1400 0 1400 FEET

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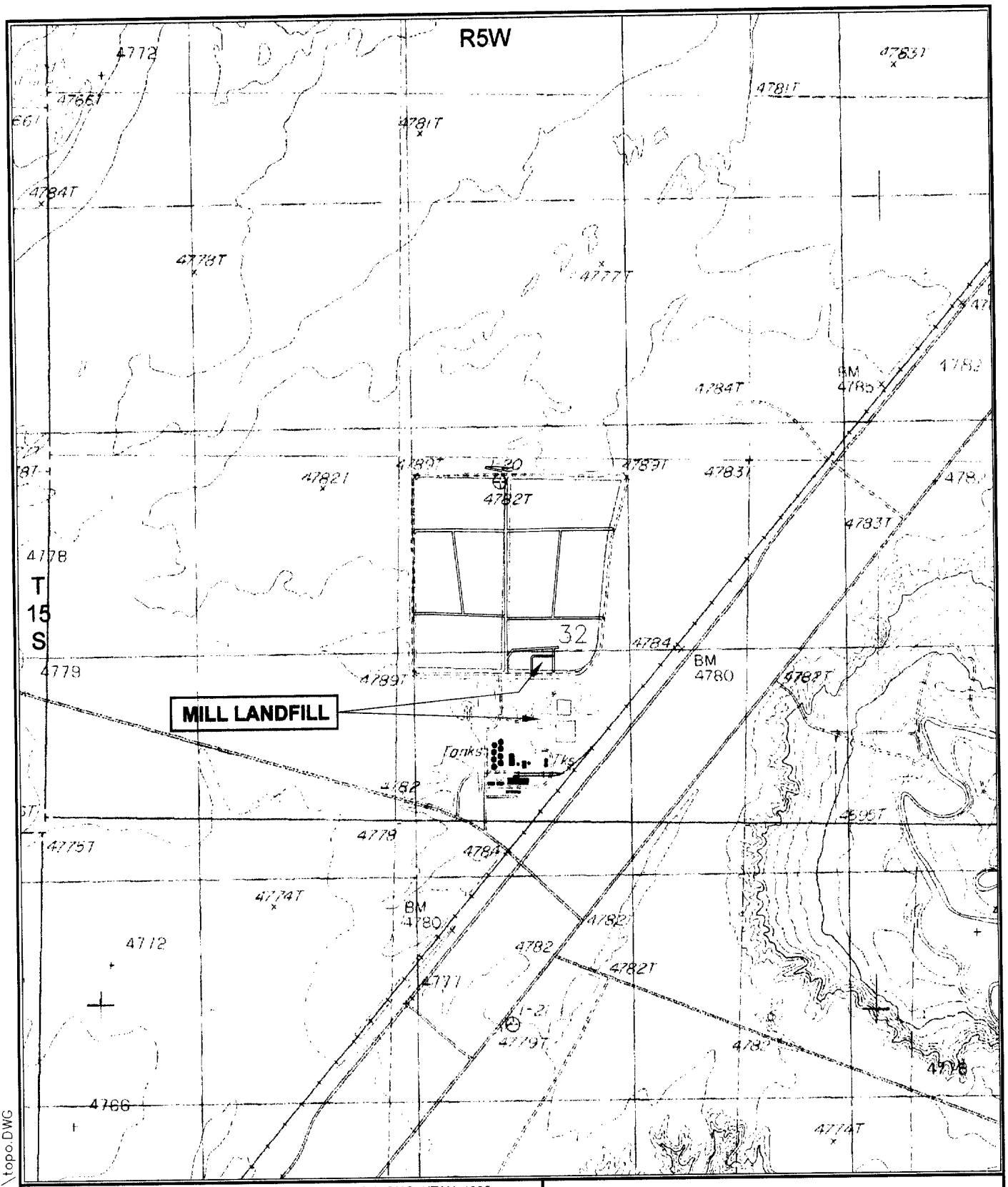
BRUSH RESOURCES

MILL LANDFILL LOCATIONS

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada Boise, Idaho

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
WF	CP		1"=1400'	9/19/02	

drawings \BRUSH\BRUSH-06\LAND.DWG



TOPOGRAHIC BASE FROM USGS 7.5' QUADRANGLE: STRONG, UTAH, 1985

2000 0 2000 FEET

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BRUSH RESOURCES

MILL LANDFILL LOCATIONS

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada Boise, Idaho

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
WF	CP		1"=2000'	4/25/03	

drawings \BRUSH\BRUSH-06\topo.DWG

Attachment B

Documentation Submitted
for
Groundwater Permit

6. Monitoring well construction is described in the following documents:

   a. *Geohydrology of the Brush Wellman Tailings Pond Site, March 16, 1987*

   b. *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry, February 2, 1993*

   c. *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry, January 22, 1999*

7. The parameters that are monitored by Brush Wellman have been established in the past by the Division of Water Quality in the permit and are listed in the *Brush Wellman Compliance and Technology Performance Monitoring Sampling Plan, February 11, 1998.*

J. Description of Operations:

The design and operation of the approved DMT was described in the *Best Available Technology Report for the Brush Wellman Delta Mill Tailings Pond, April 15, 1993.* The plans and specifications for the construction, modification and operation of the tailings disposal and seepage mound recovery systems have been submitted in the past to the Division of Water Quality and were approved by the agency on March 17, 1994. In the implementation of the approved DMT, the following modifications were made to the tailings facilities:

1. The tailings dam was raised from 15 to 28 feet using downstream construction methods according to plans and specifications approved by the Division of Water Quality and the Utah State Engineer. The dam was raised with soil borrowed from on site adjacent to the tailings pond. The inner surface of the tailings dam was protected as necessary from erosion with rip rap. This work was completed in June, 1994.

2. The interior of the tailings pond was divided into eight separate cells through the construction of approximately14,000 linear feet of dikes. These dikes were constructed on top of PVC membrane liners with tailings solids dredged from within the tailings pond. The dikes ranged from 6 to 8 feet high with a top width of about 5 feet.

3. A series of piping systems were constructed around the entire tailings dam and on the interior dikes to allow transportation of tailings and tailings water throughout the tailings facility. A peripheral pipe completely around the tailings pond was fitted with spigots and valves for future peripheral discharge of tailings. This system is currently used to transport tailings water from one cell to another to control water levels within cells and to enhance evaporation by spreading the water over a greater area in multiple cells.

4. An electrical supply system was installed around the tailings dam to provide power for portable pumps to control the distribution of tailings water within the various interior cells and for the pumps and other equipment in the tailings cyclone plant. A separate electrical system was installed to power the seepage mound recovery system.

5. A tailings cyclone plant was built in the center of the south tailings dam to process tailings slurry from the mill and separate it into sand and slime fractions. These materials are pumped to the desired cells within the tailings pond. This cyclone plant is automated to allow startup and shutdown both locally at the cyclone plant and remotely from the main mill building.

6. A seepage mound recovery system was installed west and southwest of the tailings pond. This system consists of 22 seepage mound recovery wells pumping into a common piping system which can transport the water to the mill and the tailings pond where it is used. This is an automated system that can be started and stopped both locally in the field and from the main mill building. The wells in this system have been extensively maintained to provide maximum pumping performance and many of them have been redrilled.

7. A computer control system was installed to operate and record the performance of the seepage mound recovery and tailings cyclone facilities.

The DMT system was put into operation on September 1, 1995.

K. Ground Water Hydrology:

The ground water hydrology at the tailings pond site has been described in the following documents that have been submitted to the Division of Water Quality:

1. *Geohydrology of the Brush Wellman Tailings Pond Site, March 16, 1987*

2. *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry, February 2, 1993*

3. *Best Available Technology Report for the Brush Wellman Delta Mill Tailings Pond, April 15, 1993*

4. *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999*

L. Compliance Sampling Plan:

Compliance sampling is described in the permit and in the, *Brush Wellman Compliance and Technology Performance Monitoring Sampling Plan, February 11, 1998.*

Attachment C

Groundwater Permit

COPY

APPLICATION TO RENEW
BRUSH WELLMAN TAILINGS POND
GROUND WATER DISCHARGE PERMIT
NO. UGW27001

January 19, 1999

Submitted by:

Brush Wellman, Inc.
P.O. Box 815
Delta, Utah 84624

Prepared by:

JBR Environmental Consultants
8160 S. Highland Drive
Sandy, Utah 84093

APPLICATION TO RENEW
BRUSH WELLMAN TAILINGS POND
GROUND WATER DISCHARGE PERMIT
NO. UGW27001

This application document is submitted by Brush Wellman, Inc. to the Division of Water Quality to renew the Ground Water Discharge Permit No. UGW27001 for the tailings pond at the Brush Wellman Delta Mill. As per previous discussions and correspondence between Brush Wellman and the Division of Water Quality, this application refers out to other documents that have been prepared related to the tailings pond operations and the local hydrogeology. This application is organized according to the applicable portions of UAC R317-6-6.3.

A. Applicant:

Brush Wellman, Inc.
P.O. Box 815
Delta, Utah 84624

Director of Utah Operations

Donald McMillan
(435) 864-1235

B. Legal Location:

The facility is located in Sections 31 and 32, T15S, R5W Millard County (See attached Figure 1)

C. Facility:

The Brush Wellman Delta Mill, is a primary beryllium concentrate production facility primarily processing bertrandite ore produced approximately 50 miles west of the mill and also beryl ore imported from out of the U.S. The anticipated life of the facility is 50 years.

D. Wells:

The locations of all water wells, topography, springs, water bodies, drainages, and structures within one mile of the tailings pond are shown on Figure 2. The figure also shows the locations of existing and proposed wells to be used for monitoring ground water quality.

E. Geologic, Hydrologic, and Agricultural Description:

The geologic and hydrologic description of the area within a one-mile radius of the tailings pond is described in the report entitled, *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry*. This report was originally submitted to the Division of Water Quality in February 1993. The revised version of the report was completed on January 22, 1999 and has been submitted to the Division of Water Quality as a separate document from this application. The only agricultural use within a one-mile radius of the tailings pond is cattle grazing on the adjacent land owned by the Bureau of Land Management.

F. Description of Tailings:

The type, source, and chemical, physical, radiological, and toxic characteristics of the tailings has been studied in the past. These characteristics have been described in the following documents that have been submitted to the Division of Water Quality:

1. *Geohydrology of the Brush Wellman Tailings Pond Site, March 16, 1987*

2. *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry, February 2, 1993*

3. *Report of Investigations of Tailings Characteristics for a Low Permeability Liner at the Brush Wellman Delta Mill, March 8, 1993*

4. *Best Available Technology Report for the Brush Wellman Delta Mill Tailings Pond, April 15, 1993*

5. *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999*

The most recent description of the tailings characteristics is included in Section 4.0 of the *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999.*

G. Discharge Control:

Information which shows that the discharge to the tailings pond can be controlled and will not migrate into, or adversely affect the quality of, other waters of the state is contained in the following documents:

1. *Geohydrology of the Brush Wellman Tailings Pond Site, March 16, 1987*

2. *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry, February 2, 1993*

3. *Report of Investigations of Tailings Characteristics for a Low Permeability Liner at the Brush Wellman Delta Mill, March 8, 1993*

4. *Best Available Technology Report for the Brush Wellman Delta Mill Tailings Pond, April 15, 1993*

5. *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999*

H. Ground Water Quality:

The water chemistry of the ground water under the tailings pond has been determined from past monitoring and is described in Section 5.0 of the *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999.*

I. Monitoring Plan:

1. Monitoring of ground water and the seepage mound is described in the *Brush Wellman Compliance and Technology Performance Monitoring Sampling Plan, February 11, 1998* (Attached). This has previously been reviewed and approved by the Division of Water Quality.

2. Installation of the ground water and seepage mound monitoring wells is described in Section 2.0 of the *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999.*

3. The hydrologic and geologic description for the compliance monitoring area is described in Section 3.0 of the *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999*

4. The vadose zone adjacent to the seepage mound is monitored in the shallow monitoring wells DH-22, 28, 33, 36, 42, and 44. These wells, and all other seepage mound monitoring wells, are monitored monthly by measuring the depth to water in each well.

5. After the cessation of operations, all discharge of tailings water to the tailings pond will cease, as will operation of the seepage mound recovery system. The remaining water in the tailings pond will be evaporated, and the surface of the dried tailings will be covered with a soil growth medium. Perennial vegetation will be re-established on this soil cover to stabilize the surface of the cover and inhibit infiltration. The deep compliance monitoring wells will continue to be monitored as necessary after closure of the tailings pond, according to the requirements of the Ground Water Discharge Permit in force at the time of cessation of operations.

6. Monitoring well construction is described in the following documents:

   a. *Geohydrology of the Brush Wellman Tailings Pond Site, March 16, 1987*

   b. *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry, February 2, 1993*

   c. *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry, January 22, 1999*

7. The parameters that are monitored by Brush Wellman have been established in the past by the Division of Water Quality in the permit and are listed in the *Brush Wellman Compliance and Technology Performance Monitoring Sampling Plan, February 11, 1998.*

J. Description of Operations:

The design and operation of the approved DMT was described in the *Best Available Technology Report for the Brush Wellman Delta Mill Tailings Pond, April 15, 1993.* The plans and specifications for the construction, modification and operation of the tailings disposal and seepage mound recovery systems have been submitted in the past to the Division of Water Quality and were approved by the agency on March 17, 1994. In the implementation of the approved DMT, the following modifications were made to the tailings facilities:

1. The tailings dam was raised from 15 to 28 feet using downstream construction methods according to plans and specifications approved by the Division of Water Quality and the Utah State Engineer. The dam was raised with soil borrowed from on site adjacent to the tailings pond. The inner surface of the tailings dam was protected as necessary from erosion with rip rap. This work was completed in June, 1994.

2. The interior of the tailings pond was divided into eight separate cells through the construction of approximately14,000 linear feet of dikes. These dikes were constructed on top of PVC membrane liners with tailings solids dredged from within the tailings pond. The dikes ranged from 6 to 8 feet high with a top width of about 5 feet.

3. A series of piping systems were constructed around the entire tailings dam and on the interior dikes to allow transportation of tailings and tailings water throughout the tailings facility. A peripheral pipe completely around the tailings pond was fitted with spigots and valves for future peripheral discharge of tailings. This system is currently used to transport tailings water from one cell to another to control water levels within cells and to enhance evaporation by spreading the water over a greater area in multiple cells.

4. An electrical supply system was installed around the tailings dam to provide power for portable pumps to control the distribution of tailings water within the various interior cells and for the pumps and other equipment in the tailings cyclone plant. A separate electrical system was installed to power the seepage mound recovery system.

5. A tailings cyclone plant was built in the center of the south tailings dam to process tailings slurry from the mill and separate it into sand and slime fractions. These materials are pumped to the desired cells within the tailings pond. This cyclone plant is automated to allow startup and shutdown both locally at the cyclone plant and remotely from the main mill building.

6. A seepage mound recovery system was installed west and southwest of the tailings pond. This system consists of 22 seepage mound recovery wells pumping into a common piping system which can transport the water to the mill and the tailings pond where it is used. This is an automated system that can be started and stopped both locally in the field and from the main mill building. The wells in this system have been extensively maintained to provide maximum pumping performance and many of them have been redrilled.

7. A computer control system was installed to operate and record the performance of the seepage mound recovery and tailings cyclone facilities.

The DMT system was put into operation on September 1, 1995.

K. Ground Water Hydrology:

The ground water hydrology at the tailings pond site has been described in the following documents that have been submitted to the Division of Water Quality:

1. *Geohydrology of the Brush Wellman Tailings Pond Site, March 16, 1987*

2. *Brush Wellman Tailings Pond Site Geohydrology and Geochemistry, February 2, 1993*

3. *Best Available Technology Report for the Brush Wellman Delta Mill Tailings Pond, April 15, 1993*

4. *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999*

L. Compliance Sampling Plan:

Compliance sampling is described in the permit and in the, *Brush Wellman Compliance and Technology Performance Monitoring Sampling Plan, February 11, 1998.*

M. Flooding Potential:

The tailings pond is totally enclosed with an earth dam which is immune from runon effects from a 100-year storm. The design minimum freeboard for the tailings dam is 3 feet which is sufficient to contain the 2.4-inch precipitation from the 100-year storm that would be collected within the tailings pond. This topic is further discussed in Section 2.0 of the *Best Available Technology Report for the Brush Wellman Delta Mill Tailings Pond, April 15, 1993*

N. Contingency Plan:

No Contingency Plan for regaining and maintaining compliance with the permit limits and approved Discharge Minimization Technology has been required to date because the permitted facilities have been operated within full compliance of the permit requirements.

O. Facility Inspections:

Inspections of the permitted facilities are conducted in compliance with the permit conditions. These inspections include:

1. Daily visual inspections of the DMT facilities,
2. Daily records of the operation of the cyclones and pumps,
3. Daily records of the discharge location for slimes and sand in the tailings pond,
4. Daily records of the movement of tailings water within the tailings pond,
5. Daily records of the operation of forced evaporation systems,
6. Daily records of the seepage mound recovery wells that are operating,
7. Daily records of the amount of seepage mound water pumped and where it was directed to (mill and/or tailings pond)
8. Daily records of the amount of tailings slurry pumped to the tailings pond,
9. Daily records of raw water usage, and utility water pumped,
10. Monthly mapping of the operation of the tailings pond cells and calculation of areas, change from previous month, and slime sealing accomplished,

11. Monthly sounding of the seepage mound in the shallow monitoring wells,

12. Monthly reporting for the total and average gallons pumped from the seepage mound during the month,

13. Monthly updating of water level graphs for the monitoring wells,

14. Semiannual sounding and sampling of the water levels in the compliance monitoring wells,

15. Annual recalculation of the seepage mound size and shape.

P. Corrective Action Plan:

No Corrective Action Plan or other response measures to remedy violation of applicable ground water quality standards, class limits, or permit limits has been necessary to date because the facilities have been operated in compliance with these standards and limits.

Q. Other Information Required by the Executive Secretary:

Other information required to be submitted for the renewal of this permit has been stipulated in the existing permit and in correspondence from the Division of Water Quality. This other information is hereby submitted.

1. Conceptual Closure Plan

The conceptual closure plan for the tailings facility was submitted by Brush Wellman to the Division of Water Quality on October 28, 1993 (Attached). Since then, radionuclides have been discovered in the tailings in concentrations sufficient to require a license from the Utah Division of Radiation Control. Brush Wellman has informed the Division of Radiation Control that it will cooperate and submit the required documentation to receive a license, including submission of the necessary closure plans to satisfy the regulatory requirements of the Division of Radiation Control. Until that time, the conceptual closure plan previously submitted to the Division of Water Quality is considered to be sufficient by Brush Wellman.

2. Proposed Locations and Design for New Compliance Monitoring Wells

Based on the description of the seepage mound included in Section 3.0 of the *Geohydrology of the Brush Wellman Tailings Pond Site, January 22, 1999*, Brush Wellman proposes to install one more down-gradient compliance monitoring well in a location shown on Figure 3. This well would be installed to a depth of approximately 160 feet to penetrate through the clay aquitard and

intercept approximately 25 feet of the underlying upper artesian aquifer. The well would be double cased to protect the aquifer. A steel conductor well casing would be installed from the ground surface to a depth of approximately 10 feet into the top of the clay aquitard and the drill hole annulus outside of this casing would be fully grouted with cement (see Attached Design Figure). A 2-inch PVC casing would then be installed in a smaller drill hole within the conductor casing to penetrate into the aquifer. The screen zone of this smaller well casing would be completed with PVC well screen and sand pack but the rest of the annulus outside of this casing would be grouted with bentonite.

2. Prediction of the Future Affect of the DMT on the Seepage Mound

The affect of the currently approved DMT on the shape and size of the seepage mound over the next 5-year permit term has been modeled with the USGS MODFLO computer model. This effort is described in the report entitled: *Variably-Saturated Ground Water Flow Model of Seepage Mound Growth, Brush Wellman Tailings Facility,* by TRC Hydro-Geo Consultants. This report has been submitted separately to the DWQ.

4. Recommendation for Future Ground Water Modeling

At the end of this next 5-year permit term, Brush Wellman proposes to conduct additional computer modeling to predict the affect of continued use of the approved DMT on the seepage mound using a model acceptable to the Division of Water Quality. The modeled time period for this next modeling effort would be long enough to simulate the long-term change in shape and size of the seepage mound after closure of the tailings pond.

5. Design Goals and Performance to Date for the Approved DMT

The design goals and criteria for the approved DMT were described in the *Best Available Technology Report for the Brush Wellman Delta Mill Tailings Pond, April 15, 1993* and in the permit. Brush Wellman believes that the DMT has proven to be effective. The design goals and the performance noted to date are described below:

a. Reduce wastewater flow to the tailings pond to no greater than 864 acre-feet per year. This has been accomplished with annual wastewater flows from 1994 - 1998 ranging from 629 to 811 acre-feet which are significantly less than the maximum discharge amount allowed by the permit.

b. Provide a peripheral discharge system which will allow distribution of tailings anywhere in the tailings pond for increased evaporation. This was accomplished with installation of an 8-inch HDPE pipeline completely around the tailings pond with numerous spigots for controlled tailings discharge and eight pumping locations for recovery and relocation of collected water.

c. Provide a seepage mound recovery system of wells that can remove at least 250 acre-feet of seepage mound water per year and recycle this water to the mill operations and tailings pond for disposal. The permit required that this maximum pumping rate would be achieved after the tailings pond was sealed. This was accomplished by the installation to date of 22 recovery wells. The pumping recovery rate for the seepage mound recovery system has ranged from 55 (1995 partial year) to about 260 acre-feet per year (1997 and 1998. This effort is ahead of schedule and has resulted in removal of a significant amount of water from the seepage mound already even though the tailings pond is not yet fully sealed.

d. Provide a series of dikes, piping, cyclones, and other equipment which will allow separation of the sand from the slimes and selective disposal of both materials in the tailings pond to allow construction of a 2-foot thick liner of slimes throughout the tailings pond with a maximum average permeability of 1×10^{-6} cm/sec. This was accomplished with the installation of dikes to produce eight cells, a cyclone station to separate the tailings solids, and various required electrical and mechanical equipment to transport tailings slurry and water to and between the various cells. All of these features have been successfully operated since their construction. To date two cells, E-4 and W-4 that together equal approximately 28% of the tailings pond have been fully lined with slimes according to the DMT and various thicknesses of slime liner have been deposited in another five cells. One cell, W-1, has been used for disposal of all sand. In general, approximately 69% of the total amount of slime liner material required to seal the pond has been deposited to date. Taking into account that the slime lining began in September, 1995 and that this process was predicted to take approximately 5 to 6 years, the progress toward sealing the pond is ahead of schedule.

In general, Brush has complied with all the DMT requirements of the permit. All the required features of the DMT have been constructed as permitted. The system of processing the tailings into sand and slime fractions and sealing the pond with the slimes has proven to be successful and is ahead of schedule. The seepage mound recovery system is pumping at the permit- required rate and is also ahead of schedule in this regard.

Permit No. UGW270001

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
UTAH WATER QUALITY BOARD
SALT LAKE CITY, UTAH 84114-4870

GROUND WATER DISCHARGE PERMIT

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 1953, as amended, the Act,

Brush Wellman, Inc.
P.O. Box 815
Delta, Utah 84624

is granted a renewed ground water discharge permit for the operation of a Beryllium Mill tailings disposal facility located 10 miles northeast of Delta, Utah. The facility is located on a tract of land within the NE¼; Section 32, Township 15 South, Range 5 West, Salt Lake Base and Meridian, Millard Co., Utah to wit:

The permit is based on representations made by the permittee and other information contained in the administrative record. This permit amends and supersedes all other ground water discharge permits previously issued. It is the responsibility of the permittee to read and understand all provisions of this permit.

The tailings facility shall be operated in accordance with conditions set forth in the permit and the Utah Ground Water Quality Protection Regulations.

This permit shall become effective August 17, 1999

This permit shall expire August 17, 2004

Executive Secretary
Utah Water Quality Board

PART I. SPECIFIC PERMIT CONDITIONS

A. GROUND WATER CLASSIFICATION. The ground water classification of the upper most artesian aquifer under the tailings facility is Class I ground water quality for the upgradient wells and downgradient wells DH-31 and DH-32. Downgradient well DH-30 contains Class III quality ground water.

B. BACKGROUND WATER QUALITY. The quality is based on historical data collected prior to original permit issuance and subsequent data collected as compliance data under permit conditions from the 6 monitoring wells screened in the upper artesian aquifer listed in Table 1. The data from these wells are used to establish background water quality

C. PERMIT LIMITS

1. Protection Level Permit Limits - The permittee shall comply with all the permit limits established from the ground water standards contained in Utah's Ground Water Quality Protection Regulations (R317-6). The parameters and the protection levels in Table I are based on compounds that may be in a discharge from operation of the facilities. Protection levels in Table I are not to be exceeded in the downgradient monitoring wells screened in the upper artesian aquifer. An out-of-compliance condition with these permit limits is defined in Part I.G. Utah's Ground Water Quality Protection Regulations also contain standards for other compounds such as metals, pesticides and volatile organic chemicals. The ground water around the site must meet all the applicable protection levels contained in R317-6 even though this permit does not require monitoring for each specific chemical listed in the regulations. Therefore, the permittee shall only discharge normal operation wastes to the tailings pond limited to slurry discharges from the tailings disposal tank, treated sanitary sewage, and other inert solid wastes from the mill operations that may contain beryllium. Discharge to the tailings pond of other compounds in other than deminimus concentrations including those defined (unless conditionally exempt) as hazardous wastes under UAC R315 such as paints, used oil, antifreeze, lab waste, metals, leachates, corrosives, pesticides or volatile organic compounds is prohibited under this permit. Changes in the current average composition of the waste stream must be reported to the Division within 5 days at the address in part II D.

Background Wells
Table 1

Parameter			Nielson Stockwell		DH14		MW31	
units mg/l	Detection Level	G.W. Standard	Mean	Mean + 2 Std. Deviation	Mean	Mean + 2 Std. Deviation	Mean	Mean + 2 Std. Deviation
Arsenic	0.005	0.05	0.011	0.03094	0.013192	0.035884	0.01139	0.03095
Barium	0.02	2.0	0.04259	0.07178	0.091417	0.142762	0.05047	0.006367
Beryllium	0.001	0.004	0.0008	0.0015	No data	No data	0.00077	0.00149
Cadmium	0.001	0.005	0.00841	0.01527	0.01	0.03	0.00812	0.01623
Chromium	0.005	0.1	0.00953	0.01656	0.010833	0.016361	0.00924	0.01658
Copper	0.01	1.3	0.00982	0.01648	0.01125	0.016855	0.00947	0.01239
Fluoride	0.1	4.0	0.33706	0.40991	0.5875	1.046856	0.36588	0.41344
Lead	0.005	0.015	0.01219	0.03368	0.012917	0.030456	0.01282	0.03396
Mercury	0.002	0.002	0.00047	0.00225	0.000267	0.000502	0.00056	0.00254
Nitrate	0.02	10.0	0.25265	0.63757	0.641083	1.525676	0.10694	0.23158
Nitrite	0.02	1.0	0.00529	0.00643	0.009667	0.017297	0.01274	0.06356
Selenium	0.002	0.05	0.00349	0.00876	0.003917	0.010573	0.00306	0.00821
Silver	0.002	0.1	0.03838	0.26932	0.010833	0.016361	0.03732	0.26875
Sulfate	5.0	250	41.9258	83.9371	70.65833	132.19241	62.3765	75.4824
TDS	10.0	500	330.176	475.924	393.75	472.72732	413.294	475.9142
Zinc	0.02	5.0	0.06712	0.23056	0.114417	0.579459	0.132	0.63916
pH	0.05	6.5-7.5	8.10294	8.92347	8.235833	8.541715	8.00813	8.70121
Radium 226 pCi/L	0.5	5	0.45714	1.10616	No data	No data	0.36154	1.4861
Radium 228 pCi/L	0.5	5	1.02143	3.34912	No data	No data	0.92308	2.60036

Parameter			Nielson Stockwell		DH14		MW31	
units mg/l	Detection Level	G.W. Standard	Mean	Mean + 2 Std. Deviation	Mean	Mean + 2 Std. Deviation	Mean	Mean + 2 Std. Deviation
Thorium 230 pCi/L	1	5	0.75385	1.76946	No data	No data	1.04167	3.83745
Thorium 232 pCi/L	1	5	0.46154	1.24025	No data	No data	0.375	1.01336
Uranium Total pCi/L	0.008	30	2.00643	4.68521	No data	No data	2.78477	5.96963

Ground Water Compliance Wells
Table 1A

Parameter			DH30			DH31			DH32		
units mg/l	Detection Level	G.W. Standard	Mean	Mean + 2 Std. Deviation	Protection Level	Mean	Mean + 2 Std. Deviation	Protection Level	Mean	Mean + 2 Std. Deviation	Protection Level
Arsenic	0.005	0.05	0.08067	0.14555	0.14555	0.03418	0.05473	0.043	0.02276	0.03637	0.031
Barium	0.02	2.0	0.05676	0.08418	0.50	0.05323	0.09048	0.1	0.05471	0.09126	0.1
Beryllium	0.001	0.004	0.00076	0.00149	0.001	0.0007	0.0015	0.001	0.00076	0.00149	0.001
Cadmium	0.001	0.005	0.007	0.01549	0.01	0.00673	0.01539	0.01	0.007	0.01549	0.01
Chromium	0.005	0.1	0.00814	0.01364	0.025	0.00948	0.01993	0.023	0.00835	0.01354	0.01
Copper	0.01	1.3	0.0119	0.0341	0.50	0.01123	0.02300	0.1	0.01133	0.02302	0.1
Fluoride	0.1	4.0	0.76524	0.91151	1.20	0.60864	0.75035	0.66	0.59381	0.77317	0.63
Lead	0.005	0.015	0.01214	0.03535	0.025	0.01182	0.03469	0.022	0.01214	0.03535	0.023
Mercury	0.002	0.002	0.00036	0.00113	0.001	0.00031	0.00107	0.0002	0.00143	0.01242	0.0002
Nitrate	0.02	10.0	0.1292	0.37592	5.0	0.1385	0.36916	1.0	0.31329	0.61767	1.0
Nitrite	0.02	1.0	0.007	0.01432	0.5	0.02361	0.11718	0.1	0.00965	0.03875	0.1
Selenium	0.002	0.05	0.00279	0.00747	0.005	0.00293	0.00761	0.01	0.00299	0.00776	0.01
Silver	0.002	0.1	0.0309	0.24083	0.025	0.02973	0.23511	0.01	0.03181	0.24153	0.02
Sulfate	5.0	250	62.0571	76.90206	77.0	69.4409	78.63056	86	67.3571	77.51411	84.0
TDS	10.0	500	498.619	545	623	490.429	575	540	456.19	525	525
Zinc	0.02	5.0	0.02657	0.06232	2.5	0.02723	0.071778	0.5	0.02614	0.06798	0.5

Parameter			DH30			DH31			DH32		
units mg/l	Detection Level	G.W. Standard	Mean	Mean + 2 Std. Deviation	Protection Level	Mean	Mean + 2 Std. Deviation	Protection Level	Mean	Mean + 2 Std. Deviation	Protection Level
pH	0.05	6.5-8.5	7.99714	8.77174	6.5-8.5	8.30682	10.2593	6.5-8.5	8.11571	9.13887	6.5-8.5
Radium 226 pCi/L	0.5	5	0.4	0.93666	2.5	0.40556	0.91968	0.5	0.40625	0.93761	0.5
Radium 228 pCi/L	0.5	5	1.51875	3.745	2.5	1.32778	5.04250	1.46	1.5625	9.25173	1.72
Thorium 230 pCi/L	1	5	0.81333	1.57181	2.5	0.78588	1.63793	1.0	0.83333	2.08695	1.0
Thorium 232 pCi/L	1	5	0.97333	4.46539	2.5	0.47647	1.13634	1.0	0.49333	1.26436	1.0
Uranium pCi/L	0.008	30	1.30381	2.92708	15	0.69967	1.87293	1.87	2.85069	6.25867	3.0

D. DISCHARGE MINIMIZATION TECHNOLOGY STANDARD. The tailings disposal facility must be operated and maintained according to the following standards.

1. The administration of the permit, to assure compliance with ground water protection regulations, is founded on the use of discharge minimization technology (DMT) defined in a report dated April 15, 1993 and in a subsequent Jan. 20, 1999 version by Brush Wellman. In summary, the technology for the tailings disposal facility is:

a) A dike capacity of the tailings pond to at least the year 2010.

b) The interior tailings pond will be sealed with approximately 24 inches of tailings slimes with an effective or hydraulic conductivity of 1×10^{-6} cm/s produced in a cyclone station and be hydraulically transported and placed within separate cells that divide the pond by Dec. 31, 2002. This seal will greatly restrict seepage as it would be impossible to achieve zero discharge from the present tailing pond.

c) There will be a continuous negative rate of growth in the total wastewater seepage mound volume based on a baseline value established during the first year of operation from the effective date of this permit.

d) The seepage mound will be pumped at a minimum extraction rate of at least an annual average of 250 acre-feet per year from the current well field located west and south of the tailings pond. The goal shall be to increase this to 541 acre-feet per year by Dec. 31. 2002. The mound is targeted to be reduced by 4000 acre-feet to an approximate volume and by a date to be established in a report to be submitted for approval by Dec. 31, 2000. The pumped water will be evaporated in the tailings pond. If additional water can be pumped from the seepage mound, it will be utilized in the mill process or disposed of in the tailings pond.

e) Enhancing evaporation to the maximum extent feasible within the tailings pond through a system of pumps and piping to collect the tailings water from the north end of the tailings pond and distributing it along the southern portion of the facility where it will wet a larger area.

f) Using a continuous peripheral piping system including spigots that spreads the whole tailings along a wider discharge area to enhance evaporation. The peripheral system will be completed following slime sealing of the tailings pond.

f) The total amount of water discharged to the tailings pond from the plant shall not exceed a maximum of 872 acre-feet per year.

2. Authorized Facility - This permit covers the operation of the existing 220 acre tailings pond and associated facilities prescribed in Part I. D. 1. Any further modification by Brush Wellman to the present facilities will require both modification of this permit and a construction permit.

E. COMPLIANCE AND TECHNOLOGY PERFORMANCE MONITORING - During the period beginning with the effective date of the permit and lasting the term of the permit or as stated in an approved closure plan, the permittee shall sample wells in the underlying upper artesian aquifer, monitor technology performance wells screened in the seepage mound beneath the tailings pond, and perform technology performance monitoring of the discharge minimization technology operation of the tailings facility and the seepage mound recovery system.

1. Ground Water Quality Compliance Monitoring Points- Background water quality and compliance monitoring shall be conducted according to the provisions specified in the approved Compliance and Technology Performance Monitoring Plan in the underlying upper artesian aquifer that could be affected by contaminated discharges into the aquifer. Protection levels are those for a Class I and III ground water, as specified in Table 1a. The wells and monitoring schedules are specified below.

   a) Background monitoring wells MW31, and upgradient well DH14 and the Nielson stock well shall be sampled annually in the summer. Samples shall be analyzed for the parameters specified in Table 1. The well locations are shown in Figure 1 of the approved monitoring plan.

   b) Compliance monitoring wells DH-30, 31, 32 and a new well to be developed as per compliance schedule item H.5 are developed in the upper artesian aquifer downgradient of the seepage mound. They shall be sampled semi-annually and the samples analyzed for the parameters specified in Table 1.

2. Technology Performance Standard Monitoring- Brush Wellman shall perform the following technology performance monitoring according to the provisions specified in the approved Compliance and Technology Performance Monitoring Plan to determine if the use of DMT is controlling the seepage of tailings water to the seepage mound to the extent described in Part I.D.1.

   a) Monitor water levels in those wells tapping the seepage mound beneath the tailings pond on a monthly basis, in order to monitor the seepage from the tailings pond as required by R317-6-6.4C. These wells shall include Drill Holes 7, 8, 9, 10, 11B, 12-45, 13-60, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25B, 26, 27, 28, 29 and new wells 33, 34, 35, 36, 37, 38, 39, 40 41, 42, 44, 45, 46, 47, 48, 51, 52,

and 53. In addition, the background and compliance monitoring wells listed in above Paragraph No. 1 shall also be monitored at the same time. Their locations are shown on Figure 1 of the approved monitoring plan. Once per year, the water level readings from these wells will be used to recalculate the volume of the seepage mound according to the provisions specified in the approved monitoring plan.

b) Monitor pH of tailing pond discharge.

c) A daily operating log shall be kept of the slime sealing system indicating if the cyclones are operating and which cells are being treated with the tailings slimes.

d) A daily operating log shall be kept of the forced evaporation system indicating if water was being pumped and where it was being spread on the tailings pond.

e) A daily operating log shall be kept of the seepage mound recovery system indicating how much water was being pumped to the tailings pond and how much water was being pumped to the mill process.

f) A daily operating log shall be kept of the whole tailings pumping rate indicating the total daily slurry flow to the tailings pond.

3. Monitoring Procedures for Monitoring Wells- Monitoring shall be conducted by the permittee, according to the provisions of the approved monitoring plan and in conformance with the following procedures, beginning with the date of this permit.

a) Sampling. Grab samples shall be taken of the ground water, only after adequate removal or purging of standing water within the well casing has been performed. This shall consist of removal of three casing volumes. Field analyses shall be performed according the the approved monitoring plan.

b) Sampling Plan. Sampling shall be conducted according to the provisions of currently approved Compliance and Technology Monitoring plan attached as Appendix A of this permit. This shall conform to RCRA Ground Water Monitoring Technical Enforcement Guidance Document and the requirement of UAC R317-6-6.3L to assure the reliability and validity of the field and analytical data gathered as part of this program.

c) Laboratory Approval. All laboratory analyses shall be performed by a laboratory

certified by the State of Utah to perform tests required. Field analyses shall be performed according to the provisions of the approved monitoring plan.

d) Damage to Monitoring Wells. If any monitor well is damaged or is otherwise rendered inadequate for its intended purpose, the Executive Secretary, shall be notified within five days in writing.

F. REPORTING REQUIREMENTS - The following reporting procedures for routine and compliance reports must be met.

1. Reporting Procedures.

a) Routine. The permittee shall furnish the Executive Secretary monitoring reports of analyses of well samples and the technology performance monitoring described in Parts I E.1 and E.2. Reports shall be submitted according to the schedule in Part II D. Failure to submit the reports by the due date shall be deemed as noncompliance with this permit.

b) A summary report of construction and the seepage mound water levels and seepage mound volume for the previous calendar year as described in Part I E 2.a will be submitted annually on April 15 which includes:

i. Description of construction

ii. Information on water levels and potentiometric surface of seepage mound and compliance monitoring well data.

iii. Calculations and maps of previous years data and compilation of historical data for mound volume history, mound footprint, and water level and potentiometric profile information.

c) Copies of the operating logs described in Parts I E 2.b to e will be submitted with the reports according to the schedule in Part II D.

d) Electronic Filing Requirements - In addition to submittal of the hard copy data, above, the permittee will be required to electronically submit the required ground water monitoring data in an electronic format and at a date established by the Executive Secretary. The data may be sent by e-mail, floppy disc, modem or other

approved transmittal mechanism.

2. Other information - When the permittee becomes aware that he failed to submit any relevant facts in the permit application or submitted incorrect information in a permit application or in any report to the Executive Secretary, the permittee shall submit such facts or information within 10 days.

G. OUT OF COMPLIANCE STATUS

1. Accelerated Monitoring for Probable Out-of-Compliance Status is required if the concentration of a pollutant in any compliance monitoring sample exceeds an applicable permit limit; the facility shall then:

   a) Notify the Executive Secretary in writing within 30 days of receipt of data;

   b) Initiate monthly sampling, unless the Executive Secretary determines that other periodic sampling is appropriate, for a period of two months or until the compliance status of the facility can be determined.

2. Violation of permit Limits - Out-of-compliance status exists when:

   a) Two consecutive samples from a compliance monitoring point exceed:
      i. One or more permit limits, and;
      ii. The mean ground water pollutant concentration for that pollutant exceeds the mean by two standard deviations (the standard deviation and mean being calculated using values for the ground water pollutant at that compliance monitoring point); or

   b) The concentration value of any pollutant in two or more consecutive samples is statistically significantly higher than the applicable permit limit. The statistical significance shall be determined using the statistical methods described in Statistical Methods for Evaluating Ground Water Monitoring Data from Hazardous Waste Facilities, Vol. 53, No. 196 of the Federal Register, Oct. 11, 1988.

3. Failure to Maintain Discharge Minimization Technology Required by Permit

   a) Permittee to provide information - In the event that the permittee fails to maintain best DMT or otherwise fails to meet DMT standards as required by the permit, the permittee shall submit to the Executive Secretary a notification and description of the failure according to R317-6-6.123. Notification shall be given orally within

24 hours of the permittee's discovery of the failure of DMT, and shall be followed up by written notification, including the information necessary to make a determination under R317-6-6.16.C.2, within five days of the permittee's discovery of the failure of best available technology.

b) The Executive Secretary shall use the information provided under R317-6-6.16.C.1 and any additional information provided by the permitee to determine whether to initiate a compliance action against the permittee for violation of permit conditions. The Executive Secretary shall not initiate a compliance action if the Executive Secretary determines that the permittee has met the standards for an affirmative defense, as specified in R317-6-6.16.C.3.

c) Affirmative Defense - In the event a compliance action is initiated against the permittee for violation of permit conditions relating to best available technology or DMT, the permittee may affirmatively defend against that action by demonstrating the following:

i. The permittee submitted notification according to R317-6-6.13;

ii. The failure was not intentional or caused by the permittee's negligence, either in action or in failure to act

iii. The permittee has taken adequate measures to meet permit conditions in a timely manner or has submitted to the Executive Secretary, for the Executive Secretary's approval, an adequate plan and schedule for meeting permit conditions; and

iv. The provisions of 19-5-107 have not been violated.

4. If a facility is out of compliance the following is required:

a) The permittee shall notify the Executive Secretary of the out of compliance status within 24 hours after detection of that status, followed by a written notice within 5 days of the detection.

b) The permittee shall initiate monthly sampling, unless the Executive Secretary determines that other periodic sampling is appropriate, and it shall continue until the facility is brought into compliance.

c) The permittee shall prepare and submit within 30 days to the Executive Secretary a plan and a time schedule for assessment of the sources, extent and potential dispersion of the contamination, and an evaluation of potential remedial action to restore and maintain ground water quality to insure that permit limits will not be exceeded at the compliance monitoring point and that DMT will be reestablished.

d) The Executive Secretary may require immediate implementation of the contingency plan submitted with the original ground water discharge permit in order to regain and maintain compliance with the permit limit standards at the compliance monitoring point or to reestablish DMT as defined in the permit.

e) Where it is infeasible to reestablish DMT as defined in the permit, the permittee may propose an alternative DMT for approval by the Executive Secretary.

H. COMPLIANCE SCHEDULE AND CLOSURE REQUIREMENTS. The permittee will comply with the schedules as described and summarized below:

1. Revise and submit the Compliance and Technology Performance Monitoring Plan to include new wells and their location and compile procedures used to include both compliance and DMT performance monitoring by Dec. 31, 1999.

2. Submit by Dec. 31, 2000, a report and proposed implementation schedule for approval for the revisions to the approved Discharge Minimization Technology to include installation of additional extraction wells, enhanced evaporation or equivalent proposals in order to achieve net mound reduction objective of 241 acre feet per year and implementation by Dec. 31, 2002.

3. The slime sealing system will be operated continuously during mill operations until the entire tailings pond has been sealed with 24 inches of slimes by Dec. 31, 2002. This date may be subject to revision depending upon mill production operations.

4. Upon Executive Secretary notification, provide electronic monitoring reports

5. Install a new compliance monitoring well at an approximate location as shown on Figure 1 of the approved Compliance and Technology Performance Monitoring Plan by Oct. 1, 2000.

6. Revise and submit for approval the interim closure plan by July 1, 2001 which incorporates the provisions for mound management during facility operation and the closure and post closure period.

7. A detailed closure plan for the tailings facility shall be submitted to the Executive Secretary at least 12 months before final termination of operations at the facility. The details will follow the preliminary closure plan of October 28, 1993.

PART II. REPORTING REQUIREMENTS

A. REPRESENTATIVE SAMPLING. Samples taken in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity.

B. ANALYTICAL PROCEDURES. Water sample analysis must be conducted according to test procedures specified under UAC R317-6-6.3.12 unless other test procedures have been specified in this permit.

C. PENALTIES FOR TAMPERING. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. REPORTING OF MONITORING RESULTS. Monitoring results obtained during reporting period specified in the permit, shall be submitted to the Executive Secretary, Utah Division of Water Quality at the following address no later than the date specified following the completed reporting period:

Attention: Compliance and Monitoring Program
State of Utah
Division of Water Quality
Department of Environmental Quality
Salt Lake City, Utah 84114-4870

The quarterly due dates for reporting are: April 15, July 15, October 15, and January 15. The twice annual due dates for reporting are January 15 and July 15.

E. COMPLIANCE SCHEDULES. Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. ADDITIONAL MONITORING BY THE PERMITTEE. If the permittee monitors any pollutant more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.

G. RECORDS CONTENTS.

1. Records of monitoring information shall include:

a) The date, exact place, and time of sampling, observations, or measurements:
b) The individual(s) who performed the sampling, observations, or measurements;
c) The date(s) and time(s) analyses were performed;
d) The name of the certified laboratory which performed the analyses;
e) The analytical techniques or methods used; and,
f) The results of such analyses.

H. RETENTION OF RECORDS. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time.

I. NOTICE OF NONCOMPLIANCE REPORTING.

1. The permittee shall verbally report any noncompliance which may endanger public health or the environment as soon as possible, but no later than 24 hours from the time the permittee first became aware of the circumstances. The report shall be made to the Utah Department of Environmental Quality 24 hour number, (801) 538-6333, or to the Division of Water Quality, Ground Water Protection Section at (801) 538-6146, during normal business hours (8:00 am - 5:00 pm Mountain Time).

2. A written submission shall also be provided to the Executive Secretary within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

a) A description of the noncompliance and its cause;
b) The period of noncompliance, including exact dates and times;
c) The estimated time noncompliance is expected to continue if it has not been corrected; and,
d) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

3. Reports shall be submitted to the addresses in Part II D, Reporting of Monitoring Results.

J. OTHER NONCOMPLIANCE REPORTING. Instances of noncompliance not required to be reported within 5 days, shall be reported at the time that monitoring reports for Part II D are submitted.

K. INSPECTION AND ENTRY. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

PART III. COMPLIANCE RESPONSIBILITIES

A. DUTY TO COMPLY. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of the Division of Water Quality of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

B. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS. The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under Section 19-5-115 of the Act a second time shall be punished by a fine not exceeding $50,000 per day. Nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. DUTY TO MITIGATE. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. PROPER OPERATION AND MAINTENANCE. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

PART IV. GENERAL REQUIREMENTS

A. PLANNED CHANGES. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.

B. ANTICIPATED NONCOMPLIANCE. The permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. PERMIT ACTIONS. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. DUTY TO REAPPLY. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application should be submitted at least 180 days before the expiration date of this permit.

E. DUTY TO PROVIDE INFORMATION. The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.

F. OTHER INFORMATION. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Executive Secretary, it shall promptly submit such facts or information.

G. SIGNATORY REQUIREMENTS. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.

1. All permit applications shall be signed as follows:

   a) For a corporation: by a responsible corporate officer;
   b) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
   c) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a) The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,
   b) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to Authorization. If an authorization under Part IV G 2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV G 2. must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. PENALTIES FOR FALSIFICATION OF REPORTS. The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

I. AVAILABILITY OF REPORTS. Except for data determined to be confidential by the permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Executive Secretary. As required by the Act, permit applications, permits,

effluent data, and ground water quality data shall not be considered confidential.

J. PROPERTY RIGHTS. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

K. SEVERABILITY. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

L. TRANSFERS. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Executive Secretary at least 30 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

M. STATE LAWS. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, penalties established pursuant to any applicable state law or regulation under authority preserved by Section 19-5-115 of the Act.

N. REOPENER PROVISIONS. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. If new ground water standards are adopted by the Board, the permit may be reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The permittee may apply for a variance under the conditions outlined in R317-6-6.4(D).

2. Changes have been determined in background ground water quality.

APPENDIX A

COMPLIANCE AND PERFORMANCE MONITORING PLAN

BRUSH WELLMAN, INC. BERYLLIUM MILL
STATEMENT OF BASIS
GROUND WATER QUALITY DISCHARGE
PERMIT NO. UGW270001
August 17, 1999

1. INTRODUCTION

The Brush Wellman beryllium mill is located approximately ten miles north of Delta, in Millard County, Utah. The plant was constructed in 1968 and began operation in 1969. The plant extracts beryllium from low-grade ore mined at Brush Wellman's mines located about fifty-five miles to the west and from high-grade beryl ores imported from throughout the world. The beryllium concentrate produced is a moist precipitate which is packaged in drums and shipped to Brush Wellman's refinery at Elmore, Ohio. All plant wastewater, including tailings are disposed of in a 220-acre tailings pond located just north of the plant. This tailings pond had received all the liquid wastes from the facility since 1969.

The original ground water discharge permit required the permittee to modify the tailings disposal facility to reduce the seepage rate and to take measures to protect ground water from potential contamination. As the result of studies a discharge minimization technology (DMT) was approved for the existing facility and incorporated into the permit as performance criteria required to be implemented under the associated compliance schedule requirements. These criteria have been substantially implemented and are now included in the revised permit as standard DMT standards.

2. DISCHARGE MINIMIZATION TECHNOLOGY

The administration of the permit, to assure compliance with ground water protection regulations, is founded on the use of discharge minimization technology (DMT) defined in a report dated April 15, 1993 and in a subsequent Jan. 20, 1999 version by Brush Wellman. In summary, the technology for the tailings disposal facility is:

A. A dike capacity for the tailings pond to last at least to the year 2010.

B. The interior tailings pond will be sealed with approximately 24 inches of tailings slimes with an effective or hydraulic conductivity of 1×10^{-6} cm/s produced in a cyclone station and be hydraulically transported and placed within separate cells that divide the pond by Dec. 31, 2002. This seal will greatly restrict seepage but it will not result in zero discharge from the present tailing pond.

C. There will be a continuous negative rate of growth in the total wastewater seepage mound volume based on a baseline value established during the first year of operation from the effective date of this permit.

D. The seepage mound will be pumped at a minimum extraction rate of at least an annual average of 250 acre-feet per year from the current well field located west

and south of the tailings pond. The goal shall be to increase this to 541 acre-feet per year by Dec. 31. 2002. The mound is targeted to be reduced by 4000 acre-feet to an approximate volume and by a date to be established in a report to be submitted for approval by Dec. 31, 2000. The pumped water will be evaporated in the tailings pond. If additional water can be pumped from the seepage mound, it will be utilized in the mill process or disposed of in the tailings pond.

E. Enhancing evaporation to the maximum extent feasible within the tailings pond through a system of pumps and piping to collect the tailings water from the north end of the tailings pond and distributing it along the southern portion of the facility where it will wet a larger area.

F. Using a continuous peripheral piping system including spigots that spreads the whole tailings along a wider discharge area to enhance evaporation. The peripheral system will be completed following slime sealing of the tailings pond.

G. The total amount of water discharged to the tailings pond from the plant shall not exceed a maximum of 872 acre-feet per year.

3. GROUND WATER CLASSIFICATION

The ground water classification of the upper most artesian aquifer under the tailings facility is Class I ground water quality for the upgradient wells and downgradient wells DH-31 and DH-32. Downgradient well DH-30 contains Class III quality ground water because the background concentration of Arsenic exceeds the Ground Water Quality Standard.

4. BACKGROUND WATER QUALITY

Background water quality is based on historical data collected prior to original permit issuance and subsequent data collected as compliance data under permit conditions from the 6 monitoring wells screened in the upper artesian aquifer. These Wells are listed in Table 1 of the permit. The data from these wells are used to establish background water quality.

5. GROUND WATER QUALITY PROTECTION LEVELS

The permittee shall comply with all the permit limits established from the ground water standards contained in Utah's Ground Water Quality Protection Regulations (R317-6). The parameters and the protection levels in Table I of the permit are based on compounds that may be in a discharge from operation of the facilities. Protection levels in Table I are not to be exceeded in the downgradient monitoring wells screened in the upper artesian aquifer. An out-of-compliance condition with these permit limits is defined in Part I.G of the permit. Utah's Ground Water Quality Protection Regulations also contain standards for other compounds such as metals, pesticides and volatile organic chemicals. The ground water around the site must meet all the applicable protection levels contained in R317-6 even though this permit does not require monitoring for each specific chemical listed in the regulations. Therefore, the permittee shall only discharge normal operational wastes to the tailings pond which is limited to slurry discharge from the tailings disposal tank, treated sanitary sewage and other inert solid waste from the mill that

may contain beryllium. Discharge to the tailings pond of other compounds including those defined as hazardous wastes defined under UAC R315-1 such as paints, used oil, antifreeze, lab waste, metals, leachates, corrosives, pesticides or volatile organic compounds is prohibited under this permit.

6. COMPLIANCE SCHEDULE

The permittee will comply with the schedules as described and summarized below:

A. Revise and submit the Compliance and Technology Performance Monitoring Plan to include new wells and their location and compile procedures used to include both compliance and DMT performance monitoring by Dec. 31, 1999.

B. Submit by Dec. 31, 2000, a report and proposed implementation schedule for approval for the revisions to the approved Discharge Minimization Technology to include installation of additional extraction wells, enhanced evaporation or equivalent proposals in order to achieve net mound reduction objective of 241 acre feet per year and implementation by Dec. 31, 2002.

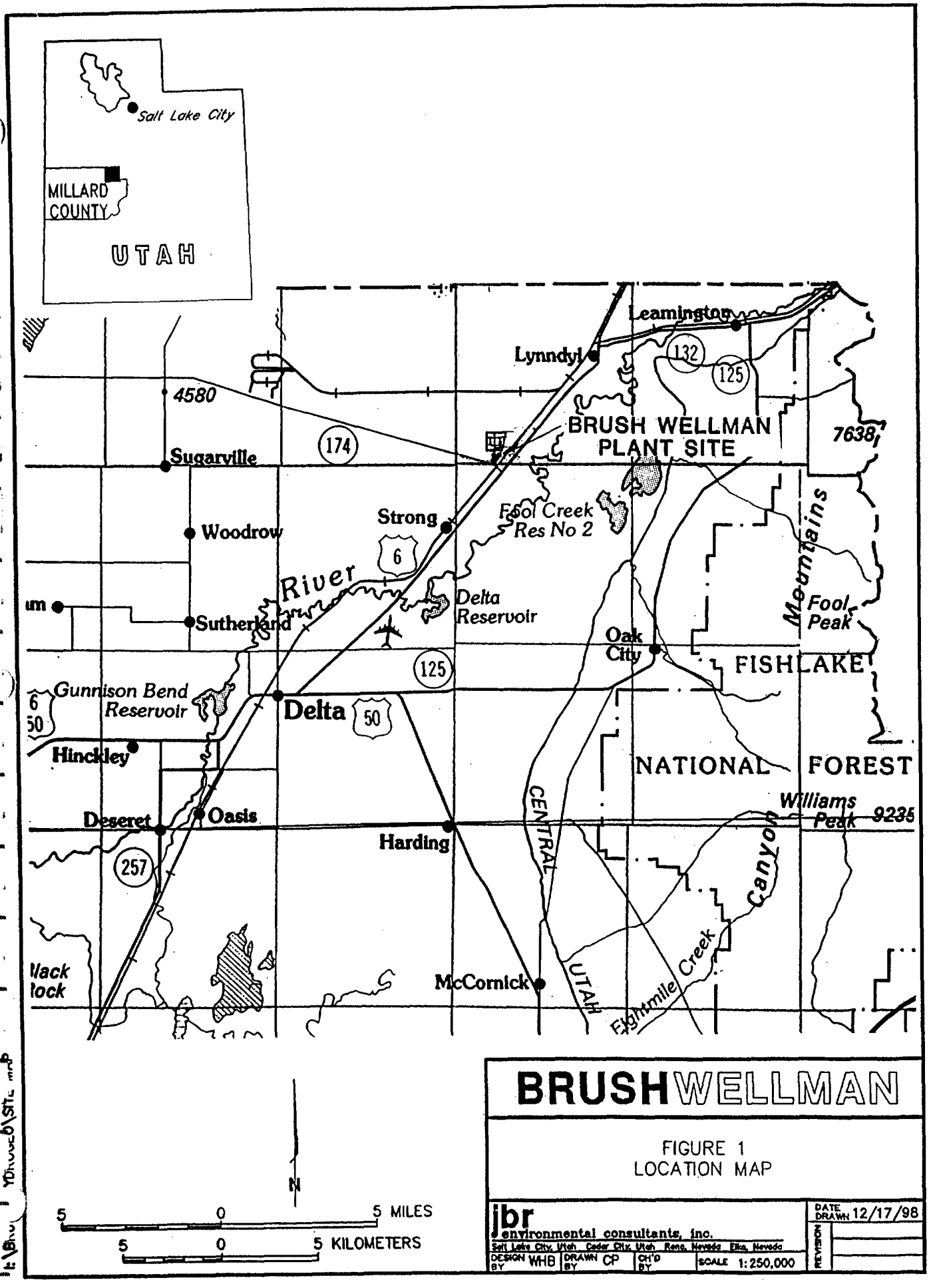
C. The slime sealing system will be operated continuously during mill operations until the entire tailings pond has been sealed with 24 inches of slimes by Dec. 31, 2002. This date may be subject to revision depending upon mill production operations.

D. Upon Executive Secretary notification, provide electronic monitoring reports

E. Install a new compliance monitoring well at an approximate location as shown on Figure 1 of the approved Compliance and Technology Performance Monitoring Plan by Oct. 1, 2000.

F. Revise and submit for approval the interim closure plan by July 1, 2001 which incorporates the provisions for mound management during facility operation and the closure and post closure period.

G. A detailed closure plan for the tailings facility shall be submitted to the Executive Secretary at least 12 months before final termination of operations at the facility. The details will follow the preliminary closure plan of October 28, 1993.

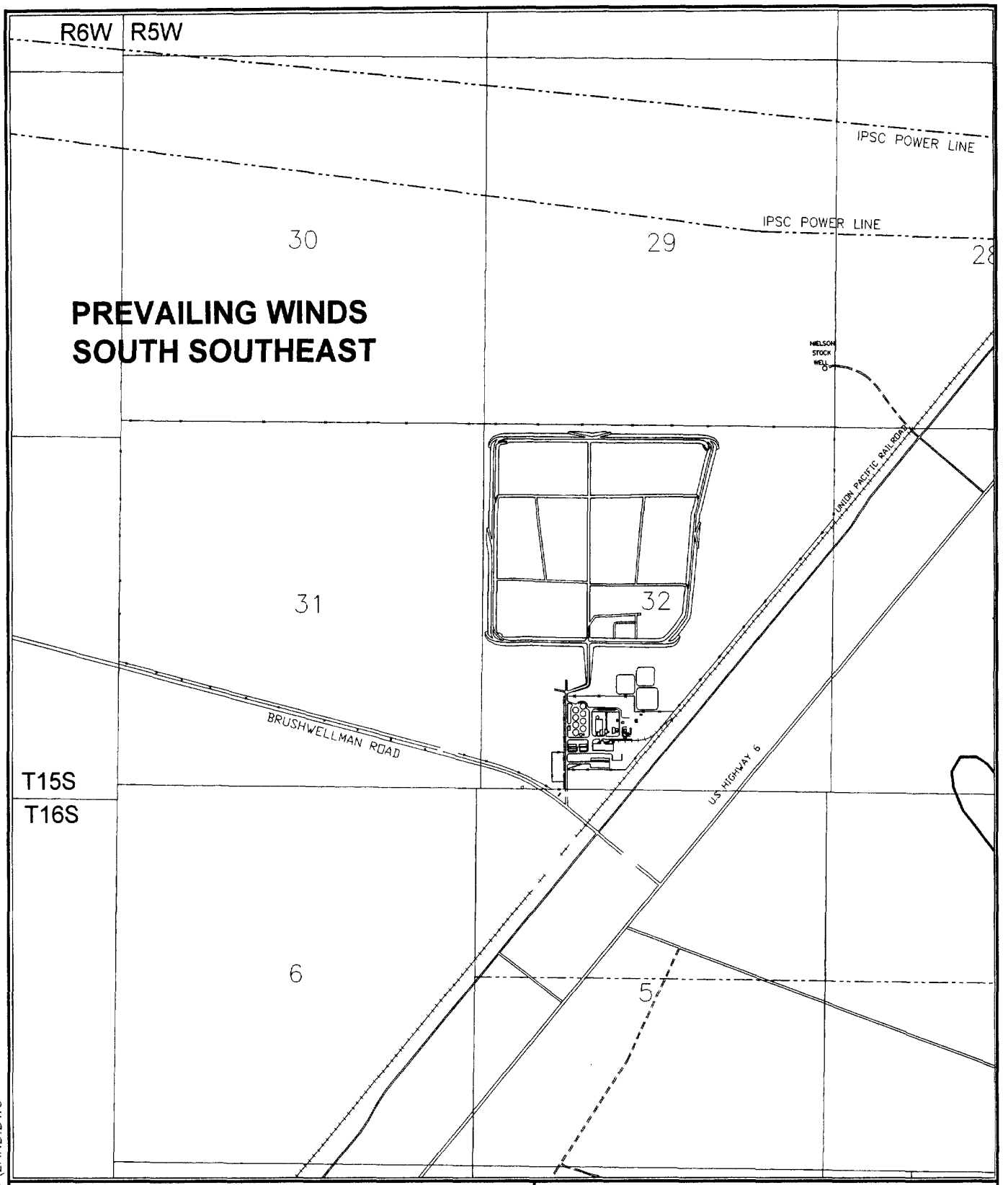


BRUSHWELLMAN

FIGURE 1
LOCATION MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
WHB	CP		1:250,000	12/17/98	



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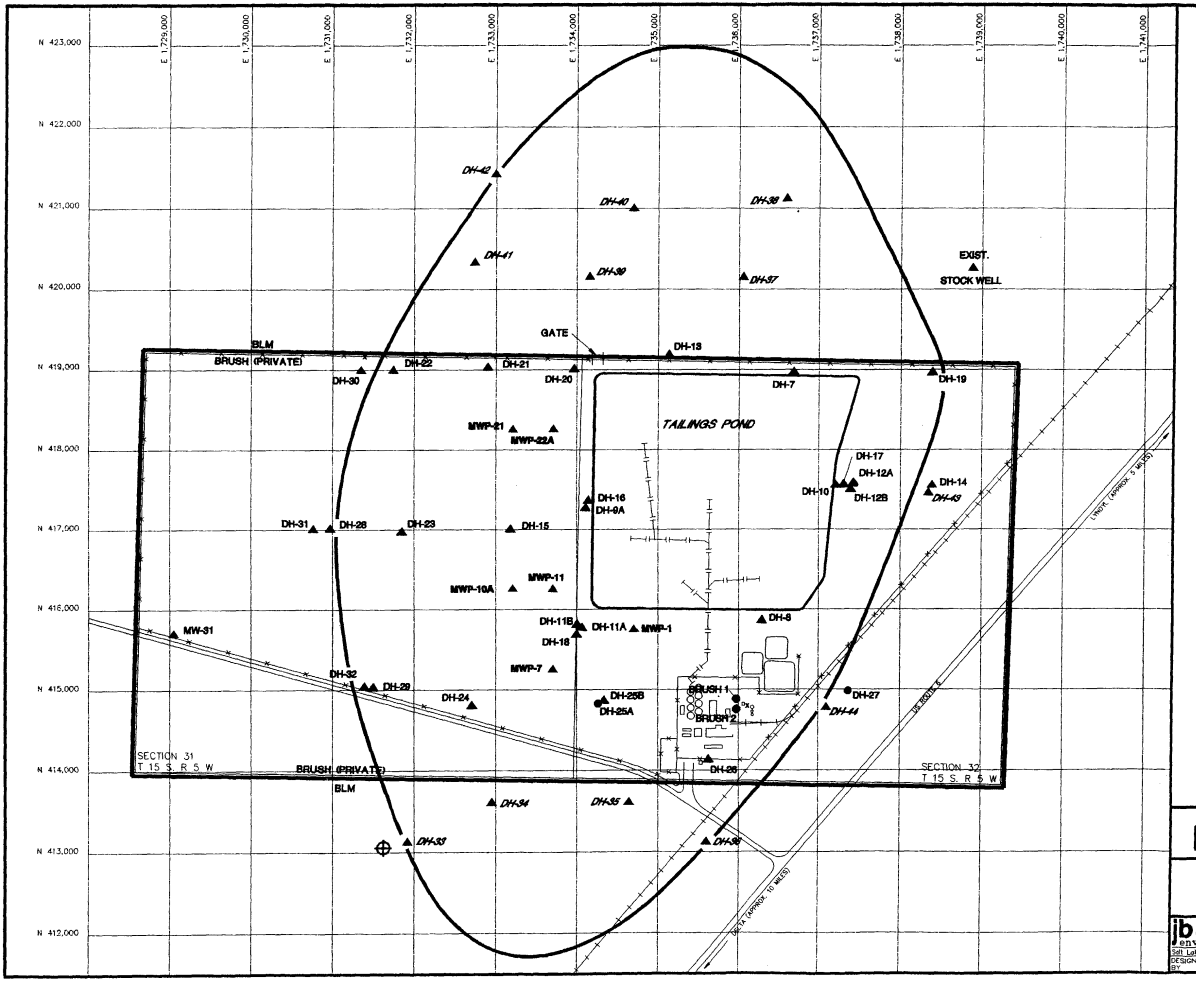
BRUSH RESOURCES

FIGURE 2
SITE MAP

jbr environmental consultants, inc.
Salt Lake City, Utah · Cedar City, Utah · Reno, Nevada · Elko, Nevada · Boise, Idaho

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
WF	CP		1"=2000'	9/19/02	



EXPLANATION

- PROPERTY BOUNDARY
- FENCE LINE
- UNION PACIFIC RAILROAD
- DH-27 BORING LOCATIONS
- SEEPAGE MOUND FOOTPRINT

WELL LOCATIONS

LOWER ARTESIAN AQUIFER

- BRUSH 1 — INDUSTRIAL USE SUPPLY WELL

UPPER ARTESIAN AQUIFER

- DH-14 — MONITORING WELL
- PROPOSED MONITORING WELL

SEEPAGE MOUND

- DH-19 — MONITORING WELL
- DH-39 — 1998 MONITORING WELLS
- MWP-1 — RECOVERY WELLS USED TO DEFINE 1998 SEEPAGE MOUND CONFIGURATION

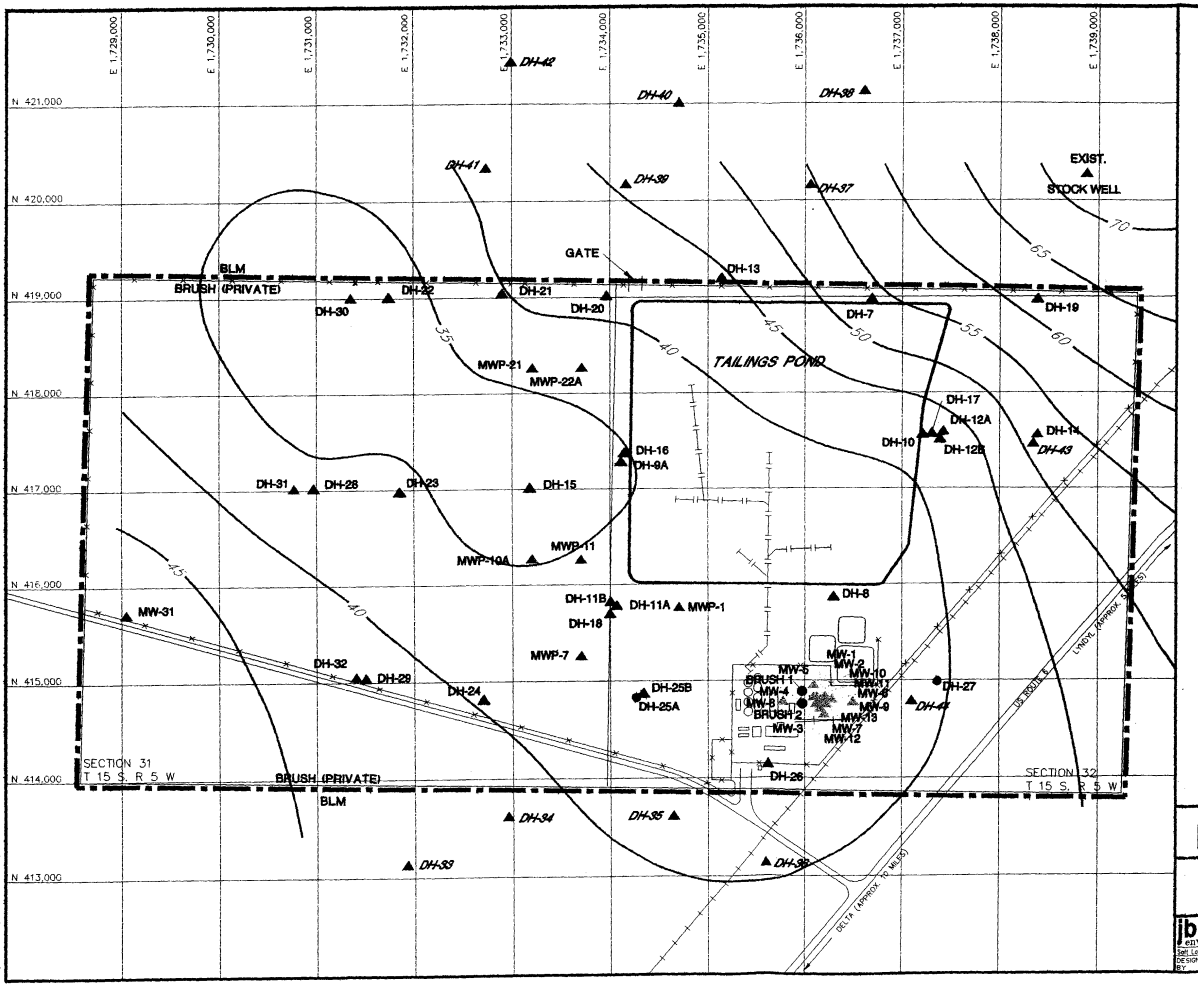
BRUSHWELLMAN

FIGURE 3
DRILL HOLE LOCATION MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
AM	CLP		1"=1200'	12/22/98	

I:\BRUSH\HYDROGEO\SEEPAGEM.DWG



EXPLANATION

- PROPERTY BOUNDARY
- FENCE LINE
- UNION PACIFIC RAILROAD
- DH-27 BORING LOCATIONS
- CLAY AQUITARD THICKNESS CONTOURS

WELL LOCATIONS

- MW-1 UST WELLS

LOWER ARTESIAN AQUIFER

- BRUSH 1 INDUSTRIAL USE SUPPLY WELL

UPPER ARTESIAN AQUIFER

- DH-14 MONITORING WELL

SEEPAGE MOUND

- DH-19 MONITORING WELL
- DH-39 1998 MONITORING WELLS
- MWP-1 RECOVERY WELLS USED TO DEFINE 1998 SEEPAGE MOUND CONFIGURATION

N

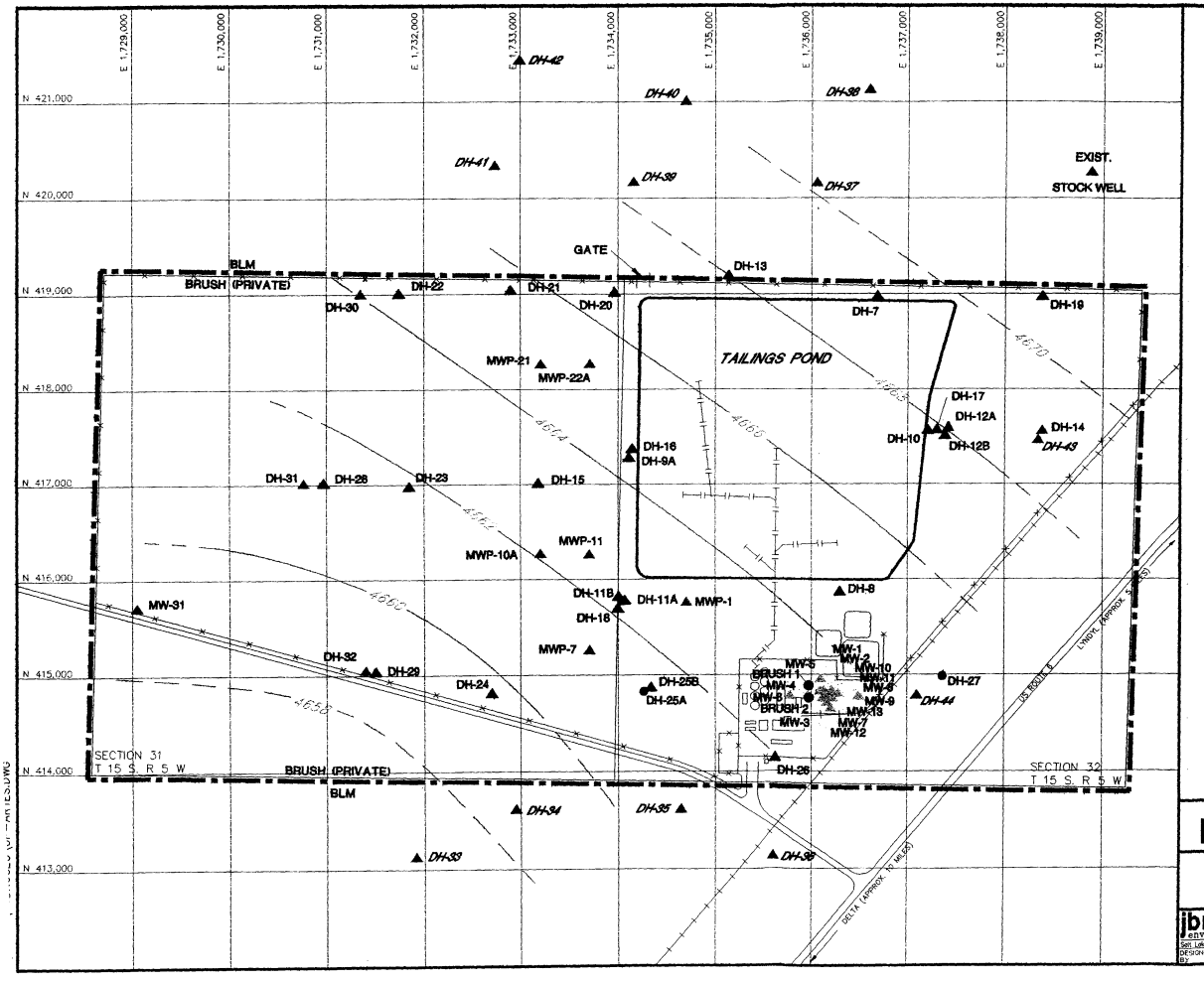
1000 0 1000

BRUSHWELLMAN

FIGURE 11
CLAY AQUITARD THICKNESS CONTOURS

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY: WB	DRAWN BY: CLP	CHK'D BY:	SCALE 1"=1000'	DATE DRAWN 12/17/98	REVISION



EXPLANATION

- PROPERTY BOUNDARY
- FENCE LINE
- UNION PACIFIC RAILROAD
- DH-27 BORING LOCATIONS
- GROUND WATER ELEVATION (DASHED WHERE INFERRED)

WELL LOCATIONS

- MW-1 UST WELLS

LOWER ARTESIAN AQUIFER

- BRUSH 1 INDUSTRIAL USE SUPPLY WELL

UPPER ARTESIAN AQUIFER

- DH-14 MONITORING WELL

SEEPAGE MOUND

- DH-19 MONITORING WELL
- DH-39 1998 MONITORING WELLS
- MWP-1 RECOVERY WELLS USED TO DEFINE 1998 SEEPAGE MOUND CONFIGURATION

N

1000 0 1000

BRUSHWELLMAN

FIGURE 12
UPPER ARTESIAN AQUIFER
POTENTIOMETRIC SURFACE

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
WB	CLP		1"=1000'	12/17/98	

Attachment D

Log sheets

Section #1 - Landfill Waste Log

Section #2 - Inspections

Brush Resources Delta Mine — Landfill Log — Cell 1 - Tailings Pond

Date	Name	Cover Applied? Y	N	Size of Load cubic yards	Contents of Load

PLEASE PRINT ALL INFORMATION

Brush Resources Delta Mine — Landfill Log — Cell 2

Date	Name	Cover Applied? Y	N	Size of Load	Contents of Load

PLEASE PRINT ALL INFORMATION

Brush Resources Delta Mill — Landfill Inspection Form

Date	Time	Landfill Cell	Name	Signature	Inspect for: malfunctions, deterioration, operator errors, discharges that cause or may cause a threat to human heatlh or the environment, any other abnorma conditions.

PLEASE PRINT ALL INFORMATION

Attachment E

General Site Safety and Training Plan Addendum

General Training and Site Safety Plan
Addendum for Landfill Operations

This plan was developed for the safety of landfill operators and operations at the Brush Resources, Inc. Mill Site, in accordance with Utah Department of Environmental Quality Administrative Code R315-302-2(2)(n).

Training will include the following topics:

1.0 Applicability
2.0 Frequency
3.0 Information and Awareness
4.0 Equipment Operation
5.0 Emergency Procedures and Notification

1.0 Applicability

A. All landfill operators must have received the general site safety training prior to receiving this training. (Note: During monthly safety meetings, waste identification and disposal methods are discussed).
B. All landfill operators will receive this training in addition to the general site safety training.
C. New or transferred employees who have landfill responsibilities will receive this training prior to working at the landfill.
D. A new or transferred employee who has not received this training may work at the landfill under the direct supervision of a trained landfill operator under: a) temporary or emergency conditions, or b) up to a period of 90 days, starting with the day the new or transferred employee began working at the landfill.

2.0 Frequency

A. All applicable employees will receive this training on an annual basis, or when significant changes occur at the landfill.

3.0 Information and Awareness

Training will include:

A. A review of the landfill permit conditions.
B. A list of acceptable and unacceptable waste for the landfill.
C. Guidelines for maintaining the landfill, (fill, cover, inspections, etc.)
D. Proper record keeping of wastes received.
E. Unacceptable waste procedures (discussed in the monthly safety meetings).
F. Alternative waste disposal in the event that the landfill is unavailable.

4.0 The Safety Officer or their designee will determine that all landfill operators are trained in the proper operation of all landfill equipment.

5.0 All landfill operators will be trained on proper landfill emergency notification procedures. Emergency procedures and/or contact numbers will be made available to all landfill operators.

Attachment #1

Post – Closure Inspection Form

Brush Resources Delta Mill — Landfill Inspection Form

Date	Time	Landfill Cell	Name	Signature	Inspect for: malfunctions, deterioration, operator errors, discharges that cause or may cause a threat to human heatlh or the environment, any other abnorma conditions.

PLEASE PRINT ALL INFORMATION

RECEIVED
03.02027
JUN 11 2003

Division of Solid & Hazardous Waste
Utah Department of Environmental Quality

Part I General Information APPLICANT: PLEASE COMPLETE ALL SECTIONS.

II. Landfill Type	☐ Class IIIa ☒ Class IIIb	III. Application Type	☒ New Application ☐ Renewal Application	☐ Facility Expansion ☐ Modification	

For Renewal Applications, Facility Expansion Applications and Modifications Enter Current Permit Number _____

III. Facility Name and Location

Legal Name of Facility
Brush Resources, Inc.

Site Address (street or directions to site)				County
10 Miles North of Delta, Utah on Highway 6				Millard
City Delta	State UT	Zip Code 84624	Telephone (435) 864-2701	
Township 15S	Range 5W	Section(s) 32	Quarter/Quarter Section	Quarter Section NE 1/4
Main Gate Latitude 39 degrees 28 minutes 22 seconds		Longitude 112 degrees 26 minutes 7 seconds		

IV. Facility Owner(s) Information

Legal Name of Facility Owner
Brush Resources, Inc.
Address (mailing)
P. O. Box 815

City Delta	State UT	Zip Code 84624	Telephone (435) 864-2701

V. Facility Operator(s) Information

Legal Name of Facility Operator
Alex Boulton, Vice President of Operations
Address (mailing)
P. O. Box 815

City Delta	State UT	Zip Code 84624	Telephone (435) 864-2701

VI. Property Owner(s) Information

Legal Name of Property Owner
Brush Resources, Inc.
Address (mailing)
P. O. Box 815

City Delta	State UT	Zip Code 84624	Telephone (435) 864-2701

VII. Contact Information

Owner Contact Dan Perry		Title Environmental Health & Safety Coordinator	
Address (mailing) Brush Resources, Inc. P. O. Box 815			
City Delta	State UT	Zip Code 84624	Telephone (435) 864-8350
Email Address		Alternative Telephone (cell or other)	
Operator Contact same		Title	
Address (mailing)			
City	State	Zip Code	Telephone
Email Address		Alternative Telephone (cell or other)	

Property Owner Contact	same	Title	
Address (mailing)			
City	State	Zip Code	Telephone
Email Address		Alternative Telephone (cell or other)	

VIII. Waste Types (check all that apply)

Waste Type	Combined Disposal Unit	Monofill Unit
☐ Construction & Demolition	☐	☐
☒ Industrial	☐	☒
☐ Incinerator Ash	☐	☐
☐ Animals	☐	☐
☐ Asbestos	☐	☐
☐ PCB's (R315-315-7(3) only)	☐	☐
☐ Other _____	☐	☐

Note: All waste types must be generated by the industry which owns the facility

IX. Facility Area

Facility Area	~40	acres
Disposal Area	< 5	acres
Design Capacity		
Years	60+	
Cubic Yards	124,170	
Tons	1600	

X. Fee and Application Documents

Indicate Documents Attached To This Application ☐ Application Fee: Amount $

☒ Facility Map or Maps	☒ Facility Legal Description	☒ Plan of Operation	☒ Waste Description
☒ Ground Water Report	☒ Closure Design	☒ Cost Estimates	☐ Financial Assurance

I HEREBY CERTIFY THAT THIS INFORMATION AND ALL ATTACHED PAGES ARE CORRECT AND COMPLETE.

Signature of Authorized Owner Representative	Title	Date
Dan Perry by DeWhaley JBR Environmental Consultants Inc.	E H&S Coordinator	6-10-03
Dan L. Perry (Name typed or printed)	Address: P. O. Box 815, Delta, UT 84624	
Signature of Authorized Land Owner Representative (if applicable)	Title	Date
Name typed or printed	Address	
Signature of Authorized Operator Representative (if applicable)	Title	Date
Name typed or printed	Address	

WHEN RECORDED RETURN TO:
A. John Davis
Pruitt, Gushee & Bachtell
1850 Beneficial Life Tower
Salt Lake City, Utah 84111

SPECIAL WARRANTY DEED

THIS SPECIAL WARRANTY DEED, executed this 24th day of January, 2001, but effective as of January 1, 2001, from BRUSH WELLMAN INC., an Ohio corporation, Grantor, to BRUSH RESOURCES INC., a Utah corporation, with an address of P.O. Box 815, Delta, Utah 84624, Grantee.

WITNESSETH:

That the Grantor, for and in consideration of the sum of Ten Dollars ($10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby convey and warrant unto Grantee, its successors and assigns forever, the following described property situated in Millard County, Utah:

Township 15 South, Range 5 West, SLM

Section 31: All
Section 32: All

Together with all appurtenances, water and water rights, fixtures and improvements thereon and all privileges thereunto incident.

EXCEPTING THEREFROM and subject to the following prior reservations: (1) all coal and other minerals, together with the right of ingress and egress for the purpose of exploring and/or removing the same; (2) that portion lying within the boundaries of the State Road right-of-way; (3) that portion lying within the boundaries of the Railroad right-of-way.

Grantor warrants the subject lands against all liens and encumbrances by persons or parties claiming by, through, and under Grantor, but not otherwise.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal the day and year first above written.

00132660 Bk 00360 Pg 00540-00541
MILLARD COUNTY RECORDER- CONNIE K HANSEN
2001 FEB 01 15:21 PM FEE $13.00 BY BRB
REQUEST: PRUITT, GUSHEE & BACHTELL

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal the day and year first above written.

BRUSH WELLMAN INC.

By: _____

Its: WM. CHRISTOFF
ASSISTANT TREASURER - TAXES

STATE OF Ohio)
:ss
COUNTY OF Cuyahoga)

On the 24th day of January, 2001, personally appeared before me, William Christoff, who, being by me duly sworn, did say that he is the Assistant Treasurer of Brush Wellman Inc. and that said instrument was signed in behalf of said corporation by authority of a resolution of its Board of Directors and said William Christoff acknowledged to me that said corporation executed the same.

Witness my hand and official seal.

_____
NOTARY PUBLIC

My Commission Expires:

LINDA J. MONTGOMERY, Notary Public
State of Ohio
My Commission Expires Sept. 30, 2004

office\wew\1450\341dux\special warranty deed

00132660 Bk 00360 Pg 00541